AVIATION WEEK

50 CENTS

LITTLE MOTOR
IN A TOUGH SPOT

That's it framed there on the left—a Honeywell standard model actuator.

Looks kind of tiny, doesn't it, next to the "Major," the giant Pratt & Whitney engine it serves aboard a Boeing Stratocruiser?

It may be little, but it's certainly not delicate.

For in the course of performing its job of opening and closing the wastegate of the engine's turbo-supercharger, this particular Honeywell actuator has absorbed hundreds of hours of punishment. Yet in spite of vibration, heat, pounding, dust—it performs as efficiently as the day it was installed.

There is a whole "family" of Honeywell actuators as tough and dependable as this one. They're designed to perform a wide variety of remote control jobs—from the one described above, to positioning dampers on aircraft heating ducts. Built to exceed the most rigid Air Force specifications, they're now available to manufacturers who are looking for rugged, quality performance.

A letter addressed to Dept. 407 (AW), Honeywell Aero Division, Minneapolis 13, Minnesota, will bring you full facts about our actuator line.

MINNEAPOLIS
Honeywell

H HONEYWELL *Aeronautical Controls*

400%

INCREASE IN PRODUCTION FACILITIES–

as Hydro-Aire moves into its new plant

The completion of the new Hydro-Aire plant at Burbank, California, supplemented by four additional plants,* increases the production facilities of Hydro-Aire 400% over 1951.

This means faster delivery of larger quantities of vital units in the field of Pumps, Hydraulic-Pneumatic Fuel System Components, and Electrical-Mechanical Actuators.

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**Including a completely equipped plant to handle special assignments and experimental projects.*

HYDRO-AIRE *Inc.*

BURBANK, CALIFORNIA

Subsidiary of Crane Co.

B.F.Goodrich

Molded lips that seal tight come open with a zip

Seal that saves muscle zips off to save time (1). In the Boeing B-47, seals were needed between elevator and stabilizer, rudder and stabilizer, and aileron and wing to make manual control easier. But with ordinary seals, hundreds of screws would have to be removed every time a control surface had to be taken off. B. F. Goodrich suggested Pressure Sealing Zippers for the flaps. Their molded rubber lips successfully prevented air flow through the hinge area. And mechanics unzip the flaps in seconds.

It lets men in—keeps fumes out (2). Keeping engine fumes out of a jet's cockpit called for a partition between cockpit and fuselage. But with a standard metal partition, mechanics would have to fuss with bolts or screws to get in for maintenance. BFG engineers' answer—a fume curtain sealed with a Pressure Sealing Zipper. The zipper's molded rubber lips provide a 100% effective seal. The curtain can be zipped open in seconds.

Shuts up torrent of hot air (3). Designers wanted to make the hot air duct in the Douglas C-124 in 6-foot sections.

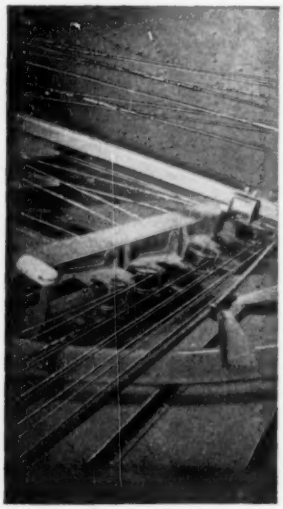
They needed a strong, flexible coupling that would permit easy removal of the sections. B. F. Goodrich Pressure Sealing Zippers proved ideal. Their molded lips provide a 100% seal. They resist heat and damage, speed maintenance.

Pressure Sealing Zippers fit irregular shapes. Can be cemented. Save space and weight. Other B. F. Goodrich products for aviation include tires, wheels and brakes; heated rubber; De-Icers; Avtrim; inflatable seals; fuel cells; Plastilock adhesives; Rivnuts; accessories. *The B. F. Goodrich Company, Aeronautical Division, Akron, Ohio.*

B.F.Goodrich
FIRST IN RUBBER

AIRCRAFT CONTROLS

There's almost no "constructional stretch" in Roebling Aircord



BEYOND MEETING today's most stringent specifications, Roebling Preformed Aircord for controls contains practically no troublesome and unpredictable "constructional stretch." For this reason, Roebling Aircord always affords maximum uniformity of control and minimizes the need for periodic take-ups.

Roebling Preformed Aircord, made of steel or of stainless steel, comes in a full range of sizes and can be furnished in complete assemblies with swaged terminals that possess the full strength of the cord itself.

Write for complete information about Aircord and other test- and time-proven Roebling aircraft products. And call on Roebling's engineering staff for any desired suggestions and assistance. John A. Roebling's Sons Company, Trenton 2, New Jersey.

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ROEBLING

Aviation Week

ABP Member ABC

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SPOTTING DANGER!
SAVING LIVES!

IT'S THE *Cessna L-19* BIRD DOG

America's most versatile military reconnaissance plane — specially designed and engineered for the rugged, day-to-day assignments of combat . . . battle-tested as much as 150 frontline flying hours each month . . . acclaimed by Army and Marine aviators as the really dependable light plane that has *proved* its place at the front!

And look what the Bird Dog offers: A powerful 213 HP engine, all 'round visibility, shock-resistant landing gear and high-lift flaps for easy take-offs and landings in rough terrain, *all-metal* construction, roominess and multiple-radio installations for contact with both ground *and air* units.

Yes, *all* reconnaissance aviators approve the L-19. But its biggest fan is, of course, the Infantryman. For to average GI foot soldiers, America's expanding fleet of Bird Dogs means better and more accurate battle information, easier missions and most important, fewer Purple Hearts!

We are tremendously proud of the Bird Dog's contribution to our nation's fighting power. And we hope you'll remember . . . it's a Cessna.

CESSNA AIRCRAFT COMPANY, WICHITA, KANSAS

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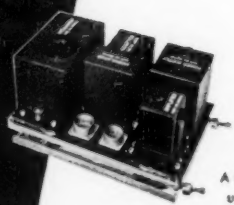

A typical Servomechanisms, Inc., assembly using packaged functions.

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Ft. Lauderdale, Florida—El Segundo, Calif.

POST AND STEWART AVES., WESTBURY, N. Y.

NEWS DIGEST

Domestic

40,000 aircraft workers were idle in the Los Angeles area last week when 15,000 employes at Douglas Aircraft Co.'s El Segundo plant went on strike. While the El Segundo local of the AFL International Association of Machinists voted 2,207 to 1,256 for the strike, the Santa Monica local voted 2,588 to 1,157 to accept the company's offer of a five-cent pay increase plus other benefits, and production continued at that plant. At Lockheed, the strike of 25,000 IAM members continued, but did not affect production at the company's subsidiary, Lockheed Aircraft Service, Inc.

McDonnell F-101 Voodoo twin-jet long-range fighter has been ordered in undisclosed numbers for the Strategic Air Command. With other USAF and Navy orders, this brings McDonnell's backlog to almost $400 million.

Army Secretary Frank Pace and other high-ranking Army officials were "greatly impressed" by last week's demonstration of American Helicopter's collapsible single-place XH-26 pulsejet copter. Pace termed it "beginning of new era" for Army aviation.

DC-3 crash-landed in a New Jersey swamp about five miles south of Elizabeth where three airliners crashed with loss of 119 lives last winter. William Oswald, chief test pilot of Babb Co., which had sold the plane to Wien-Alaskan Airlines, was giving the DC-3 a final test flight when both engines went dead, one soon dropping from the plane in flames. Neither Oswald nor the other two men aboard were injured.

Six Marine Corps F9F Panthers rammed a cloud-hidden mountain in South Korea while returning from a mission Sept. 10. The planes, an entire flight, had been diverted from their home base because of bad weather and were heading for an unfamiliar field when they hit the 3,000-ft. peak, killing all the pilots.

2d Lt. David Claude Ryan, 22, eldest son of T. Claude Ryan, aircraft builder, was killed when his F-86 failed to pull out of a low-level bombing run, just two weeks before he was to have completed his advanced training as a jet pilot at Nellis AFB, Las Vegas.

New York International Airport's new control tower was dedicated at Idlewild Sept. 16. The $1-million cost of the 150-ft., 11-story tower includes more than $600,000 worth of radio and radar.

ALUMINUM ANNIVERSARY of the Boeing Superfortress was celebrated Sept. 21, ten years after the first XB-29, dressed in olive drab, took off from Seattle's Boeing Field in 1942. It was not until June 1944 that the public heard of the new bomber—then the world's largest and fastest—after a fleet of the Superforts raided a Japanese target. A total of 3,970 B-29s had been built (2,766 by Boeing, 668 by Bell Aircraft, and 536 by Glenn W. Martin), when production ceased.

Guy M. Turner, 61, aviation pioneer and superintendent of Oakland, Calif., airport for 25 years, died in Oakland Sept. 10. He helped prepare a 7,000-ft. runway at Oakland for the Maitland-Hegenberger flight to Hawaii in Army's "Bird of Paradise." During World War II he was a chief aviation machinist in the Navy. He was awarded a membership in the Institute of the Aeronautical Sciences in 1934.

Jet fuel supply could be increased if small refiners would turn more to the production of such fuels, experts at the National Petroleum Assn.'s Golden Anniversary in Atlantic City agreed. Jet fuels are now available in adequate quantities, but allout emergency would change that, the refiners were told.

Beechcraft T-36A factory-made parts will be used as "textbooks" for USAF mechanics under a new Air Training Command program. The men could be trained in fundamentals of T-36A maintenance before they set eyes on the plane itself. Production of the USAF trainer, now in the tooling stage, will start on completion of new $1.3-million building at the main Beechcraft plant, Wichita.

A. P. Fontaine, vice president and general manager of Consolidated Vultee Aircraft Corp., San Diego, will resign Oct. 1, to accept a new position in the East, company president Gen. Joseph T. McNarney disclosed last week. McNarney will add the duties formerly controlled by Fontaine to his own. In another company move, Charles D. Perrine, formerly assistant chief engineer for missiles and electronics, San Diego, was named assistant division manager of the Pomona Guided Missiles div.

Financial

Temco Aircraft Corp. has declared regular quarterly dividend of five cents plus five cents extra, payable Sept. 30.

Cessna Aircraft Co. reports retail sales of private airplanes in excess of $1.5 million for August, its largest unit and dollar volume this year. Cessna has led the industry in private plane sales each month this year, the company claims.

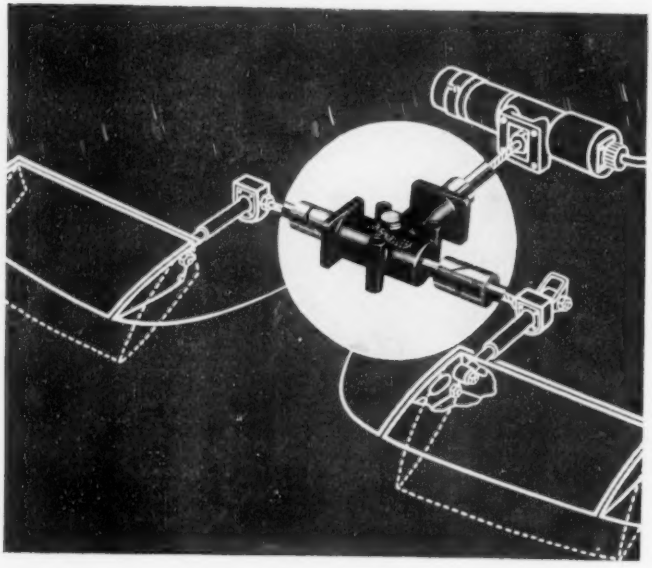
International

Prof. Ernest Heinkel, German aircraft designer, believes West Germany should be licensed to produce European aircraft designs, as without German production he does not think demand can be satisfied. Germany still has the technical capacity for building aircraft, Heinkel stated after a visit to the SBAC display at Farnborough, England, although much of its machine tools, plant and equipment would have to be bought or made. He sees no hope of catching up with the progress made in the seven years Germany has lost, if production should start from scratch. British jet engines have developed to "extraordinary maturity" following the lines of German constructors during the war, Heinkel says, and the era of the propeller plane is "rapidly nearing its end."

Australian imports of aviation products increased to over $8 million last year, compared with the previous year's $3.5 million. Exports of engines and spares were worth $1.4 million.

Trans-Australia Airlines' five Convairs have been used so extensively that they have grossed more than three times their initial cost in four years, the carrier says. Maintenance costs have been below expectations. The company states that only government refusal to sanction dollar outlay keeps it from buying more Convairs.

ANGLgear supplements rotary actuator on TRIM TAB CONTROL SYSTEM



In some aircraft installations, ANGLgears supplement other Airborne products. This horizontal stabilizer trim tab control system is a good example of such an application.

A 3-way ANGLgear® right angle, bevel gear unit, an R-118 Rotorac® Electric Rotary Actuator, two screw jacks and suitable linkage make up the system.

ANGLgears have hardened gears, ball bearings, flanged end mountings, 3-bolt side mountings, and an internal pilot on mounting ends. Ratio is 1:1. Lubricated for life.

Two basic sizes with three ratings are described in the I. A. S. Aeronautical Engineering Catalog. Consult it for dimensions and other pertinent information.

AIRBORNE

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AVIATION CALENDAR

Sept. 23-25—Air Transport Assn. annual engineering and maintenance conference, Saxony Hotel, Miami Beach, Fla. (closed meeting this year).

Sept. 25-26—Radio Technical Commission for Aeronautics fall assembly meeting, Hotel Statler, Buffalo, N. Y.

Sept. 26-28—Aero Medical Assn., interim meeting, Paris, France.

Sept. 27—Nantucket Air Tour dinner and hangar dance (Ancient Order of the Deep), Nantucket Is., Mass.

Sept. 29-Oct. 1—National Electronics Conference, Sherman Hotel, Chicago.

Sept. 30-Oct. 2—Aircraft Spark Plug and Ignition Conference, sponsored by Champion Spark Plug Co., Toledo.

Oct. 1-4—Society of Automotive Engineers national aeronautics meeting, aircraft engineering display and aircraft production forum, Hotel Statler, Los Angeles.

Oct. 7-8—Aircraft Electrical Society ninth annual display meeting, Pan Pacific Auditorium, Los Angeles.

Oct. 9-10—Airport management operations conference, Oklahoma University.

Oct. 11-18—Fourth annual All-Texas Air Tour; information available from Texas Aeronautics Commission, Austin.

Oct. 19-24—American Welding Society national fall meeting, Bellevue-Stratford Hotel, Philadelphia.

Oct. 25-Nov. 2—International aviation and travel exposition, Navy Pier, Chicago.

Oct. 28-30—Transport Aircraft Hydraulics System Conference, sponsored by Vickers, Inc., Hotel Park Sheraton, Detroit.

Oct. 28-30—AIEE Air Transport Committee annual meeting, Commodore Perry Hotel, Toledo.

Oct. 29-31—AIEE conference on machine tools, Ten Eyck Hotel, Albany, N. Y.

Nov. 6-7—National fuels and lubricants meeting, Society of Automotive Engineers, The Mayo, Tulsa, Okla.

Nov. 11-12—Piper distributors' annual meeting, Lock Haven, Pa.

Nov. 17-20—National Aviation Trades Assn. annual convention, Hollywood-Roosevelt Hotel, Los Angeles.

Dec. 2—Symposium on light-metal heavy forgings and extrusions for aircraft, SAE, ASME, IAS and AIME.

Dec. 10-12—Joint AIEE-IRE-ACM conference on electronic computers, Park Sheraton Hotel, New York.

PICTURE CREDITS

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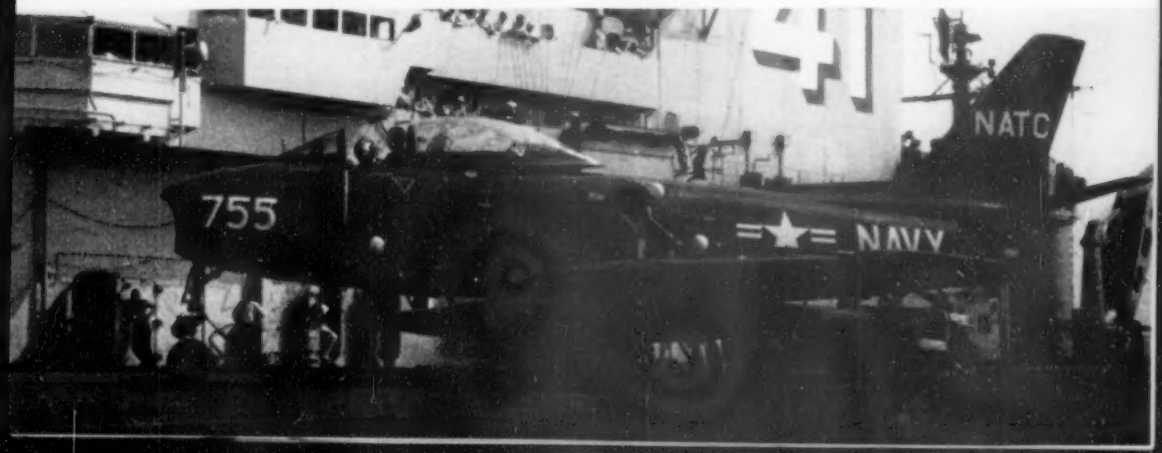
COUGARS AND CUTLASS GET SET—Two new Grumman F9F-6 Cougars (foreground) and a silver Chance Vought F7U-3 Cutlass await signal to start jet engines for carrier qualification trials on the USS Midway. Note wing fences on the Cougars.

New Jets Try Their Sea Wings

CUTLASS DRAWS A CROWD—The big twin-jet F7U-3 Cutlass (left) is surrounded by Navy men while being fueled aboard the Midway.

FURY READIED FOR TAKEOFF—North American XFJ-2 Fury (below) gets hooked up to one of the Midway's Jeep-mounted engine starters during its carrier trials. All three new types of Navy fighters recently passed the carrier qualification tests.



INDUSTRY OBSERVER

This week's column was cabled from London by AVIATION WEEK *executive editor Robert B. Hotz, who is studying the British aircraft industry after attending the annual SBAC show at Farnborough.*

► First off-shore purchase contract for the British aircraft industry will go to Vickers-Armstrongs for the Supermarine Swift. Contract may involve up to 300 Swifts to be produced first in Britain. Later, Fokker probably will supply airframes from Holland. Final details on the contract are now being ironed out in London, and negotiations between the British and Dutch also are reaching a climax.

► **The Hawker Hunter may not qualify for off-shore purchase delivery date of 1955 because of production lag and RAF priority. Second off-shore contract is likely to go for increased DH Venom night fighters in Italy. Five hundred Venoms may be involved.**

► There is growing appreciation in top British aviation circles of transonic performance and combat ability of the North American F-86 Sabre. British, who a few years ago were inclined to regard the North American sweepback as premature, now candidly admit they stuck to straight wing too long and as the result are without a first-line RAF fighter in service.

► **Shortly before he died, the late John Derry, crack de Havilland transonic test pilot, wrote: "Recent show by the F-86 had the audience (all experienced pilots) on their toes. It may have been near the bone, but few pilots can know their aircraft better and few watchers would have believed the highly loaded American aircraft capable of such maneuvers had they not witnessed them."**

► RAF expects to get about 300 Canadair airframes with General Electric J47 engines next year. The earlier scheme to provide RAF with Sabre airframes with British Rolls-Royce Avons was scrapped because R-R couldn't make sufficient engines in addition to heavy British military requirements in time to meet the proposed delivery schedule. British pilots believe the Sabre being built in Australia with Avons and armed with four 20-mm. cannon may be the best of the F-86 types now being built in three countries.

► **Texas Engineering and Manufacturing Co. of Dallas is building a new military trainer powered by an Armstrong Siddeley Mamba turboprop rated at 1,475 eshp. The new Temco trainer is due to fly this fall.**

► Napier's compound engine, the Nomad, may be used in later versions of the Bristol Britannia transport if early promise of extremely low fuel consumption is realized in actual flight operations. Nomad may also be used in the new Saunders-Roe flying boat patrol bomber project. Saro project has a low priority at present despite a definite military requirement for a long-range patrol boat for the RAF Coastal Command. The Nomad still is in early development stage and will not be ready for regular airframe installations for some time.

► **Both the big Avro delta 698 bomber and the Gloster Javelin delta night fighter are using the latest up-rated versions of the Avon and Sapphire, respectively. The Avro 698 is powered by four 7,500-lb.-thrust Avons, while the Javelin uses a pair of 8,300-lb.-thrust Sapphires.**

► English Electric has a transonic bomber design in the works featuring an over-and-under installation of two jet engines similar to the Short S. A. 4 nacelle arrangement.

► **There is no future in sight for really large aircraft in Britain. Second and third Saunders-Roe Princess flying boats and the Second Bristol Brabazon are being moth-balled before completion. Second Cierva Air Horse (the project has been taken over by Saunders-Roe) will be dismantled after completing 25 hr. flight testing.**

WHO'S WHERE

In the Front Office

William F. Gerety has joined Kaman Aircraft Corp., Windsor Locks, Conn., as assistant to the president. He will handle outside manufacturing. His prior position was purchasing agent for Chance Vought Aircraft.

Changes

Edward F. Katzenberger has been named to the newly created position of chief development engineer, general design, for Sikorsky Aircraft division, Bridgeport, Conn. **Miller A. Wachs** has advanced to chief development engineer, component design and **Ralph B. Lightfoot** has been designated chief of aerodynamics and flight research. Other promotions and their new titles: **Walter Gerstenberger**, chief of dynamics; **Harry I. Jensen**, chief test engineer; **Donald M. Plumb**, senior project engineer and **Ralph A. Alex**, development engineer.

Robert H. Frost has been promoted to chief engineer for Stanley Aviation Corp., Buffalo, N. Y.

Donald L. Murphy has been appointed manager of a new department for personnel and industrial relations in the Aeronautical division of Minneapolis-Honeywell Regulator Co., Minneapolis.

C. B. Bailey-Watson, formerly technical editor of the British aviation weekly, Flight, has joined Bristol Aeroplane Co., Ltd. as public relations manager.

John Alico has joined Lake Erie Engineering Corp., Buffalo, N. Y., as project engineer.

John F. Charf has been appointed assistant factory manager of Aeroproducts division of General Motors, Dayton, Ohio.

Jack Marler, formerly sales engineer for Beech Aircraft Corp., Wichita, Kans., has been named West region sales representative for the firm.

Tjark F. Riddle has been designated aircraft plant manager for Kaiser-Frazer, Willow Run, Mich.

Joseph S. Alan has been named field engineer in the New York office of Solar Aircraft Co., replacing **John L. Downey**, who resigned to join General Electric Co. at Lockland, Ohio.

S. P. Nunley has been made general traffic manager and assistant to vice president of Phillips Petroleum Co., Bartlesville, Okla.

Earl E. Webb has been named customer service representative for Southwest Airmotive Co., Love Field, Dallas. **E. E. Chapman** succeeds him as SAC's service parts manager.

What They're Doing

Henry M. Henion has sold his interest in Airways Engineering Corp., and has formed his own firm, Henry M. Henion & Associates, aviation ground installations specialists. The firm is located at 218 Jones Bridge Road, Chevy Chase, Md.

Hamilton Standard's long experience as a leader in propeller design and production is also devoted to supplying other equipment for such outstanding airplanes as the Douglas F4D Skyray jet fighter for the U. S. Navy.

Wherever Man Flies

HAMILTON STANDARD

PROPELLERS ★ STARTERS ★ AIR CONDITIONERS ★ FUEL CONTROLS ★ AUXILIARY DRIVES ★ HYDRAULIC PUMPS

THE BENDIX IGNITION ANALYZER GIVES ADVANCE WARNING OF SPARK PLUG FAILURE

Result: ADDED SAFETY

THE POINT OF NO RETURN BECOMES A POINT OF ASSURANCE

The Bendix Ignition Analyzer actually *foresees the future* by predicting the remaining life of spark plugs. With the Ignition Voltage Control the operator can determine the present efficiency of all spark plugs and put the finger on any weakness in the system—even though it has not yet affected the operation. If the control reveals impending trouble, corrective action may be taken *before* material harm takes place. With an airborne installation of the Ignition Analyzer, the test can be made before an over-water flight reaches the point of no return. By viewing the wave forms on the face of the 'scope and comparing with known patterns, the operator can quickly make the *right* choice . . . to return without mishap, to operate at reduced power and prevent complete engine failure or to continue safely at cruising speed.

So, for maximum safety and operating efficiency it pays to make provisions for installation of a Bendix Ignition Analyzer on all your aircraft.

Detailed information available on request.

Costs Less—Does More

The Bendix Ignition Analyzer is available for either airborne or portable-airborne installations. It can be used with either high or low tension magneto or battery ignition. It is the ignition analyzer that can predict spark plug failure before it occurs . . . make an efficient check of more than one spark plug at a time and do so on a large, easy to read screen . . . yet it costs less than comparable analyzers.

Bendix

SCINTILLA MAGNETO DIVISION OF
SIDNEY, NEW YORK

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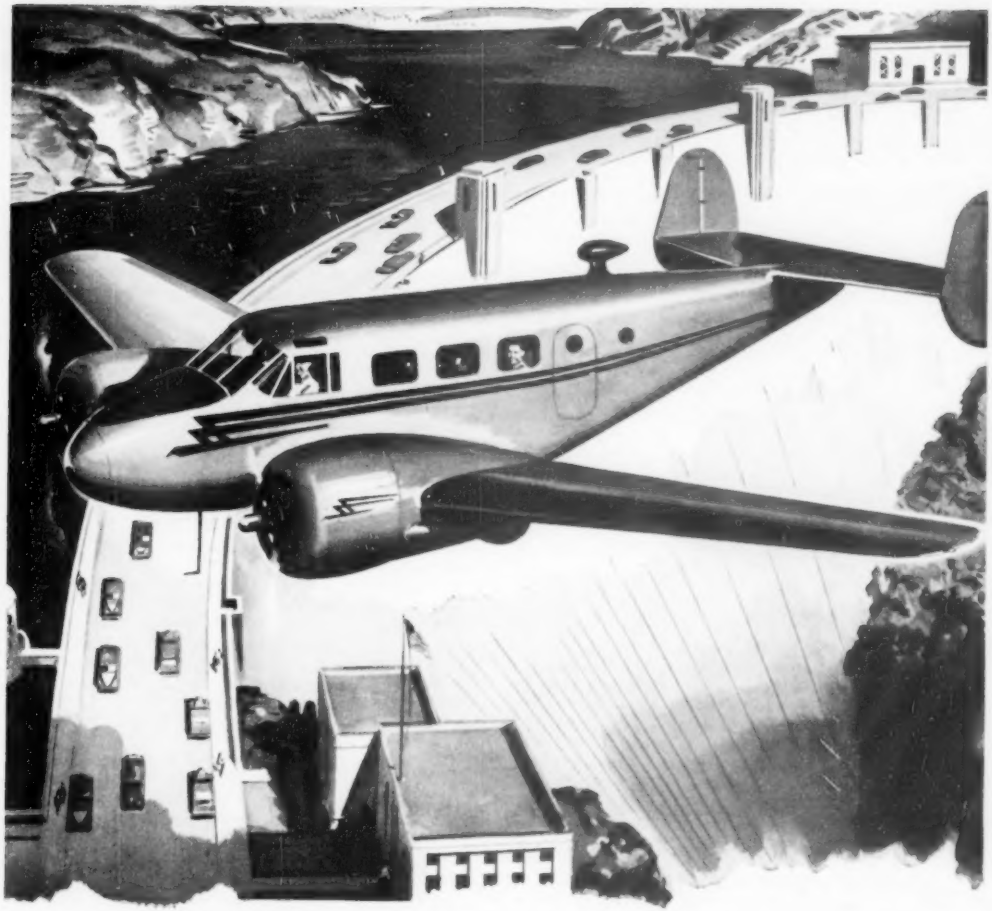

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BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

Washington Roundup

Airplane Spending

Top Defense Department officials put the brakes last week on over-optimism over progress of the defense program.

• They had countered Senate Preparedness Subcommittee's black picture of lagging aircraft production with a rosy picture of achievement: Output is up over five times the rate of two years ago.

• But when the new member of the President's Council of Economic Advisers, Robert Turner, went so far as to indicate that the buildup is about over, and about ready to start down, by reporting that expenditures have already "virtually reached their peak," Defense Department contradicted with figures.

The picture on expenditures for aircraft and related procurement–payments to manufacturers:

• The peak won't be reached until the middle of 1954. There will be some decline starting then, but expenditures will continue at a high level another year.

• In the current 1953 fiscal year, which ends July 1, expenditures, totaling an estimated $9.5 billion, will be almost double the 1952 fiscal expenditure of $5.5 billion.

• During 1951 fiscal, the year following the Korean outbreak, expenditures amounted to $2.5 billion.

Contract-Letting

Air Force started off the 1953 fiscal year with a high rate of contract-letting for aircraft, but Navy lagged.

• In the first month of the year, July, USAF obligated $1.9 billion for aircraft and related procurement. AF has $12 billion for the year: $1 billion carry-over and $11 billion new money.

• Navy obligated only $131 million for aircraft and related procurement. It has $3.5 billion for the year: $3.45 billion new, plus a $51.5-million carryover.

USAF: More Command Recognition?

Air Force is staging a drive for more recognition in joint commands over the globe.

Air Secretary Thomas Finletter launched the drive in a public address:

"The U. S. now has commands in many areas, commands in which elements of the Army, Navy and Air Force are represented. The U. S. also is part of international forces. . . . So far the command positions have been largely in the hands of representatives of other services, whether those of the U. S. or of some other country; for the concept is still strong that the air is an ancillary arm and not a full partner in terms of responsibility.

"This is a concept which no longer has any relation to fact. In any future war, the air will play a key, and in my opinion, the decisive role. Its responsibility will be primary, not secondary. It follows that assignments of command must recognize these facts and that the air of all nations, including ours, must be given their full share of command responsibility."

This is the picture on international commands:

North Atlantic. North Atlantic Treaty Organization has three co-equal top commands:

• Supreme Commander Allied Forces in Europe: Gen. Matthew Ridgway (Army).

• Supreme Allied Commander Atlantic: Adm. Lynde McCormick.

• Commander U. S. Strategic Air Force: President of the U. S. SAC is under the direction of the President.

• The other two NATO commands report to the 12-member top policy council of NATO.

And in the area commands under Ridgway:

• Southern Command is under a Navy man: Adm. Robert Carney (U. S.). As commander in chief Allied Forces Southern Europe, he commands land, air and naval forces in the area.

• Northern Command also is under a Navy man: Great Britain's Adm. Brind. As commander in chief Allied Forces Northern Europe, he also commands land, air and naval forces in the area.

• Central Command is cut into three co-equal commands, only one headed by an airman: Lt. Gen. Lauris Norstad (U. S.). He is commander in chief Allied Forces Central Europe. Commander in chief Allied Land Forces Central Europe is France's General of the Army Juin and flag officer Central Europe is France's Vice Adm. Jaujard.

Pacific. A Navy man, Adm. Arthur Radford, is U. S.'s representative on the Joint Chiefs of Staff of the Pacific Command, now being formed, with U. S., Australia and New Zealand the original participants. It will be the Pacific counterpart to NATO.

Far East. Command of directing Korean operations is headed by Army man, Gen. Mark Clark.

U. S. joint commands are split evenly:

Navy. The two major commands are both headed by Navy men: Pacific Command by Adm. Arthur Radford, and Atlantic Command by Adm. Lynde McCormick.

Army men head the Caribbean Command (Lt. Gen. Horace McBride) and U. S. forces in Austria (Lt. Gen. George Hays).

Air Force officers head the Alaskan Command (Lt. Gen. William Kepner) and the North East Command (Maj. Gen. Charles Myers), which embraces the Greenland-Labrador area, vital in air warfare.

Anti-Air Defense: Army Mission

Army is aggressively pushing its role in air defense, has already more than doubled the number of its anti-aircraft battalions since the Korean outbreak, expanding from 48 to 110. The target: "several hundred."

"The effectiveness of ground fire against aircraft is not realized," Chief of Staff Gen. Lawton Collins reports. "During World War II, we lost many more planes to enemy anti-aircraft fire than to enemy planes. And in Korea, 87% of the UN's planes lost in combat have been lost because of enemy ground fire."

His outline of Army's program for air defense:

"For low flying fast planes that come in 'on the deck,' we have the self-propelled 40-mm. guns and .50-caliber machine guns, which are capable of great fire power and rapid movement. For intermediate ranges, we have the new radar-controlled 75-mm. skysweeper gun. For high altitudes, we have our 90's and our 120's which are also directed to the target by radar. And to counter the supersonic bombers of the future, we are vigorously pushing the development of supersonic guided missiles and free rockets. Our progress in the Nike anti-aircraft guided missile is most encouraging and we have already achieved hits on maneuvering drone aircraft at great ranges and altitudes."

—Katherine Johnsen

AVIATION WEEK VOL. 57, NO. 12 SEPTEMBER 22, 1952

British Speed Empire-Wide Coach Service

- **BEA plans air tourist system throughout Europe; BOAC to spread service to Africa and Asia.**
- **And the government, seeing the service as a prime defense aid, is strengthening the nonskeds.**

By Robert B. Hotz
(By Cable to AVIATION WEEK*)*

London—The British airlines, reluctant at first to accept U.S. ideas on large-scale aircoach, now are so thoroughly sold that their own plans, plus strong government backing, promise an expansion of tourist service unmatched by any other nation in the world.

Government agencies and the two British airline corporations are pushing aircoach as hard as possible, both as a source of revenue (including foreign exchange) and for strengthening the Empire's far-flung lines of communication.

Here are the latest developments:

• **British European Airways** will introduce aircoach service (called tourist class in Europe) on the London-Paris run Oct. 1 with fares cut 25-40% under current tariffs.

• **British Overseas Airways Corp.** reports its summer trans-Atlantic coach service has been an unqualified success. Sir Miles Thomas, BOAC chairman, is negotiating arrangements to extend coach services to Africa and Asia.

• **The British government** has staked out a field in the Colonial Empire for British nonscheduled operators in "third-class" type overseas aircoach service and is selling nonskeds second-hand transport equipment from regular airlines and military services to help them operate.

Full scope of coach expansion in Europe, Asia and Africa was scheduled to be determined at the International Air Transport Assn. meeting in Geneva last week, but advance word was that satisfactory agreements were in prospect.

▶**BOAC Record**—BEA will operate London-Paris coach by special agreement with Air France, but IATA approval is required for further expansion of both BEA and BOAC aircoach plans.

During the first four months of its trans-Atlantic coach service between London-New York, Boston-Montreal, BOAC has carried 12,800 passengers in 68-passenger Constellations. Significantly, BOAC's first-class trans-Atlantic travel also showed an increase during the same period, convincing Sir Miles and his high command that aircoach was tapping an entirely new market for air travel rather than simply siphoning customers from first-class travel.

▶**Masefield's Moves**—Perhaps the most enthusiastic aircoach exponent in Europe is Peter Masefield, dynamic chief executive of BEA, who plans eventually to extend the low-fare tourist service over most of BEA's 15,000 route miles in turboprop-powered airliners.

BEA serves the densest population area outside of the United States. Masefield is convinced that aircoach service will tap a vast new air travel market in this area and will become the standard method of travel with first-class service as the frosting on the cake.

According to IATA definition, aircoach service simply sells the seat, with a reduced baggage allowance (from 66 to 33 lb.). Only coffee and cookies are served free in flight, although both food and drink may be sold in flight.

▶**Details of Two Cities**—BEA is beginning its London-Paris aircoach service with Vikings carrying 36 passengers instead of 27, by adding a center line of seats, making a four-abreast arrangement. Eight flights daily are planned, with a 40% reduction from standard fares for night schedules, and a 25% reduction for daylight flights. During the slack winter months BEA plans to convert a large portion of its 49-plane Viking fleet so the planes can be altered quickly from first-class to coach versions to meet traffic demands.

By next spring, subject to IATA approval, Masefield hopes to extend aircoach service to Ireland and Scotland. Douglas-built, Pratt & Whitney-powered converted DC-3s that BEA operates as 32-passenger Pionairs also will be used to supplement the Vikings on aircoach operations.

BEA's first-class operations will use some Vikings and all Airspeed Elizabethans. As turboprop Vickers Viscounts (renamed Discovery by BEA to avoid confusion with Vikings) go into service next spring the Elizabethans will be modified into 50-passenger aircoaches. For the future Masefield envisions a turboprop airliner twice the size of the present Discoverys, carrying 100 passengers on 360-mph. aircoach service. The present Discoverys can be modified for 53 passengers in an aircoach version if traffic demands.

MASEFIELD: Twist a trend for future.

As more economical equipment becomes available, Masefield believes tourist fares will be reduced even further. He emphatically believes that the future airline market lies in lower fares and higher volume, bolstered by economical equipment. The rising cost of surface transport and its increasingly uneconomical equipment offer a rosy future for air transport as long as it strives for the reverse of the trend prevalent in surface transport, according to Masefield.

▶**Opening for Nonskeds**—Meanwhile, British nonscheduled airlines are getting a greater opportunity to prove the value of low-cost air travel. During the past 18 months the British military has placed increasing dependence on the nonskeds to handle troop movements between the far-flung outposts of the Empire.

During the last 12 months a total of 55,000 British troops were carried by the nonskeds to Africa, the Middle East and Gibraltar. Official British sources now report that it is about $12 cheaper per man to move troops to the Middle East by air than it is by sea, aside from the time saved. The nonsked troop service has been extended recently to the West Indies and Singapore, and further expansion is in prospect as the British government becomes increasingly convinced of the necessity to

move troops by air to meet fast developing emergencies arising out of the cold war.

The second opportunity the nonskeds are exploiting is a type of group travel service by which military and civilian groups in the Colonies send their men and their dependents on leave to England. The popularity of this service, in which the nonskeds have undersold the airlines, has led the government to license third-class Colonial coach service, with regular airlines and nonskeds having equal opportunity to bid.

▶ **Same Basic Problem**—The first Colonial coach went into operation this summer on the London-Nairobi route, with weekly service provided by two nonskeds. Capacity is booked solid for months into the future. Extension of the Colonial coach license for the rest of the Empire appears certain.

But now the nonskeds face the same basic problem as the British corporation airlines: getting sufficient equipment to handle rapidly rising traffic demands for low-cost air travel. The government is selling nonskeds second-hand Dakotas and Yorks from military stocks, but the nonskeds want new-type transport equipment and are pressing for treasury financing of aircraft purchases similar to methods now used for BEA and BOAC. The nonskeds emphasize that this is cheaper than building a large military air transport service now required for fighting the cold war.

Air traffic in and out of the United Kingdom doubled during the past four years and official estimates are that it will be doubled again by 1960. Exponents of low-cost air travel believe this is a gross underestimate if air-coach is given free rein to develop and if adequate financing of new equipment is arranged.

MATS Lift Supplies Top-of-World Base

Military Air Transport Service last week disclosed it has been operating a large-scale Aertic airlift to help build and supply the top-of-the-world air base which USAF has established in Danish-owned Greenland, some 530 mi. northeast of the magnetic North Pole, 930 mi. from the true North Pole.

The base, located near the small Eskimo settlement of Thule, can be supplied by sea only two months a year.

In preparation for the two open months last year, MATS airlift carried more than 3,000 construction workers, food, prefabricated huts, tools, generators, power shovels, tank trucks to carry water, a large crane and road graders to the base. A 10-ton GCA radar system was flown in to enable planes to make all-weather landings.

▶ **Log 60,000 Hr.**—A main force of more than 4,000 additional construction workers and additional equipment came in by sea transport in July, 1951, and the job of continuing deliveries on a year-round basis was maintained by air, following departure of the last of the cargo ships early in September to avoid being trapped in the ice.

Using Douglas C-54s, R5Ds and C-124s, and Boeing C-97 transports, MATS had logged a total of 60,000 flying hr. as of Aug. 1, 1952, carrying nearly 25 million lb., including 19,040 passengers. The C-54s carried from five to six tons, while the larger planes averaged 12-ton loads. Route flown was from Westover AFB, Mass., 951 mi. to Goose Bay, Labrador, 1,021 mi. to Sandestrom Air Base, Greenland, and 760 mi. along Greenland's west coast to Thule, a total of 5,464 mi. for each roundtrip.

Before work on the major base started, a flight strip had been established at Thule in 1946, to support Danish-U.S. weather stations that are farther north.

▶ **Steel-Tread Tires**—The airlift operation involved major problems in supply and maintenance of the stations en route and many winterization problems for the planes used in the lift.

Tires with steel imbedded in the treads for operation on snow and ice had to be used.

Brakes were checked for operation in temperatures as low as −67F, oxygen systems were checked for operation altitude flights, landing light assemblies and landing gear shock struts were modified along with many other items. Maintenance at the en route stations had to be accomplished when the parts were available. Long hours in low temperatures were spent by the maintenance personnel to keep the planes moving.

But despite precautions, maintenance and supply continually hampered the operation: frozen brakes, gas leaks in the wet-wing C-54, spark plugs, dead batteries—many of them minor maintenance problems regularly occurring in cold weather, but still serious enough to keep an aircraft on the ground.

Operating in temperatures between −20F and −80F, and with limited hangar space for keeping engines warm, planes were gassed at en route stations, one side at a time, while alternate engines were running. Crews and passengers remained aboard, while lunches were brought on and flight clearances completed.

RATO ASSISTS CF-100's ORENDAS

Canada's CF-100 Canuck, long-range all-weather interceptor, gets a boost from six Rato units as it takes off at Uplands, Ont., where the plane is being tested by RCAF. Powered by two Orenda turbojets, Canuck with Rato assist was able to take off with full load of fuel and armanent plus two 1,000-lb. bombs in less than half the normal takeoff run. Plane and Orenda engine are made by Avro Canada.

British Interest In Australia

(*McGraw-Hill World News*)

Melbourne — The Anglo-Australian Long Range Weapons Experimental Establishment at Salisbury promises to become a focal point for British research and production in guided missiles and rockets.

A number of top British aviation firms are working on plans to establish plants near the test facility, namely Fairey, Bristol, Vickers-Armstrongs, Armstrong Siddeley, Armstrong Whitworth, English Electric and de Havilland Propeller Co. Ltd. It also appears likely that these plans encompass production of aircraft as well.

Seeks New Service

Hawaiian Airlines has asked Civil Aeronautics Board for permission to inaugurate service to a new airport to be opened soon at Kamuela, in the heart of the cattle ranching region on the island of Hawaii.

F-101 Voodoo Into Production

AF orders "substantial" number of McDonnell long-range fighters; report of second-source supplier denied.

By Ben S. Lee

Air Force has announced contracts with McDonnell Aircraft Corp. which order the F-101 twin-jet engined "Voodoo" long-range escort fighter into major production at St. Louis.

The F-101 is a revised version of the 700-mph.-plus XF-88 Voodoo. A "substantial" but undisclosed number will be built to equip Strategic Air Command bomber escort fighter squadrons (AVIATION WEEK Feb. 4, p. 11).

While performance and specifications remain under security wraps, the F-101 is said to be considerably larger and heavier than its F-88 protype. Power packs of the predecessor F-88 are twin Westinghouse J34-WE-22 turbojets each rated at 3,600 lb. thrust. But reports are that the production version of the F-101 probably will incorporate the Allison J71-A-6 or the General Electric J73-GE-3, both of which are rated in the 10,000-lb.-thrust category.

▶ **The Winner**—Programming of the F-101 out of 1953 funds (AVIATION WEEK Oct. 29, 1951, p. 16) followed a long and stormy procurement career. Production of its predecessor F-88 had originally been projected for early 1949. First, hit by the economy edict of that year, it was stricken from that year's production contracts.

Then, in June of 1950, Air Force ordered evaluation of three fighter types, promising a production contract to the winner of the competition. The F-88, in competition against the North American F-93 (F-86C) and the Lockheed F-90 at Edwards AFB, Calif., emerged the undisputed winner, meeting requirements set forth by SAC for escort needs.

But, meanwhile, war in Korea erupted and Air Force decided to press for heavier emphasis on current production fighters and fighter-bombers at the expense of the SAC escort fighter requirement. So, proposed production of the F-88 once again was shelved.

Last year, however, as the international scene worsened and the decision to build to a 143-wing structure was crystallized, a newly refined version of the F-88 was proposed to the Air Force to meet expanded SAC long-range fighter requirements.

▶ **Second Supplier?**—With official release of production contracts scarcely publicized, both Air Force and McDonnell officials already are denying that negotiations with a large automobile manufacturer as a second-source supplier are being finalized.

Company officials said only that "initial production of the Air Force F-101 will phase in" at the St. Louis plant of the McDonnell Aircraft Corp. on production lines adjacent to those of Navy's F3H. Second-source supplier of the F3H is Temco Aircraft Corp., Dallas.

Considerable credence nevertheless is given to probable negotiations for an F-101 second-source since Army has long pressed Air Force for ground support versions of the XF-88 and its production counterpart F-101. Army version would incorporate more firepower and armor for pilot protection.

Army's interest plus Air Force admission that F-101 possesses speed, range and endurance characteristics superior to similar current production types would seem to support integration of a second-source supplier in the near future.

▶ **Navy Work**—Contract for production of the F-101 represents the first major dollar investment by the Air Force in McDonnell Aircraft which previously has been identified as a Navy contractor and manufacturer of F2H series Banshee carrier fighters.

F2H-2 Banshee single-place fighters have been in operation aboard Navy's aircraft carriers since 1949. Phased out in April, 1952, delivery of its successor, the F2H-3, to Navy fleet units is just now getting under way. F2H-3 deliveries have been slowed, the company said, because of difficulties in procuring forgings and major equipment items. Production of the F2H-3 is scheduled through 1954 when it will be replaced by the McDonnell F3H Demon series.

In its annual report as of June, 1952, McDonnell said the Air Force F-101 contract had raised its backlog to almost $400 million.

▶ **Financial Report**—Sales during the fiscal year ending June 30, 1952, the company reported, were $81,743,306. "On these sales the earnings after taxes were $3,064,243, equal to $4.49 per common share after deducting $959,144 amortization on emergency facilities in addition to normal depreciation. The ratio of earnings after taxes to sales was 3.75% as compared with 4.35% for the 13 years since the beginning of the company. Regular dividends of $1 per common share were paid during the year. Of the 1952 earnings $2,382,273 were retained to continue the growth of the company, and the book value per common share increased from $15.80 to $19.29. The capital stock and earned surplus increased from $10,769,854 to $13,155,427."

With the number of personnel increasing from 8,226 employed on June 30, 1951, to 11,258 on June 30, this year, the aircraft manufacturing firm reported its fiscal 1952 payroll as $41,806,245.

Pilots Face New Test On City Ordinance

Air Line Pilots Assn. last week called for Civil Aeronautics Administration cooperation in seeking a better understanding of local airport problems and their relation to the overall interstate commerce picture at El Paso, Tex.

The appeal, in a letter from ALPA President Clarence L. Sayen to CAA Administrator Charles F. Horne, followed announcement that El Paso city council had passed a local ordinance regulating operational procedure of airline planes at the international airport there.

▶ **Require Flaps**—ALPA contends that the federal government has taken over regulation of interstate air commerce to the exclusion of local agencies and that therefore, ordinances such as that at El Paso can lead to an "intolerable" national situation unless steps are taken to get them rescinded.

Specifically the El Paso ordinance, "designed to keep the airport safer for airline passengers and spectators," requires pilots of planes weighing 20,000 lb. or more to lower wing flaps when starting engines on the ramp near the airport administration building. Noncomplying pilots will be fined up to $200.

The ordinance was suggested by the airport manager, Charles Moore, according to an El Paso newspaper account.

Moore has been quoted as saying American Airlines had ignored a previous policy requiring use of flaps to keep down dust on the airport and to reduce propeller wash dangerous to passengers.

▶ **Test in Court**—Practice of using flaps to divert prop wash is a fairly common one at major airports, including Washington National and others.

Sayen and ALPA argue that such operational problems should be handled by conference between interested parties, not by local laws. ALPA currently is in a federal court suit in New York testing constitutionality of an ordinance at Cedarhurst, N. Y., regulating height of airplanes passing over the village. A temporary injunction preventing enforcement of the ordinance has been granted and a permanent injunction is now being sought.

SAC Crippled

- **Tornado damages more than half our B-36s.**
- **And Congress prepares major investigation.**

A major investigation into combat readiness of the Air Force loomed this week as the Senate Preparedness Committee headed by Senator Lyndon B. Johnson began examining circumstances under which USAF permitted more than half of its Strategic Air Command B-36 striking force to be destroyed by freak high-velocity winds at Ft. Worth Sept. 1.

On that date 106 giant B-36 atom bombers were severely damaged and one was completely destroyed by high-velocity winds in the short span of 30 min. at Carswell AFB, Ft. Worth, and at the nearby Consolidated Vultee Aircraft plant just across the field from the SAC air base.

▶ **Embarrassing**—The Johnson committee will seek to determine why more than half the available striking force of Strategic Air Command was concentrated in one area at any given time. Air Force spokesmen admitted that concentration of more than half-billion dollars worth of aircraft—almost the entire B-36 potential of the SAC air force—had placed that command in an embarrassingly vulnerable position.

He added that it was extremely fortunate that the resultant damage had been an "act of God" and not that of an aggressor nation bent on creating a World War III Pearl Harbor. Official Air Force said only that most of the planes would be back in operational service by Oct. 1.

In an official report by Air Force inspector Lt. Gen. Bryant Boatner, director of operations Maj. Gen. Roger Ramey and Air Weather Service commander Maj. Gen. W. O. Senter, any negligence on the part of 8th Air Force Headquarters at Carswell was denied. The report commended commanders of that base and the Convair plant for their fortitude in preventing any further damage to aircraft and installation equipment during the freak wind storm.

▶ **$100-Million Loss**—Air Force said that of the B-36 bombers at Carswell, one was demolished and 71 others were damaged in varying degrees but that owing to the complexity of the aircraft it was impossible to determine the exact dollar loss caused by the storm. However, the Air Force said preliminary estimates indicate that the cost of repairs to the Air Force including damage to base facilities would total approximately $48 million.

This figure did not include damage to 35 other B-36 aircraft parked on ramps across Carswell runways at the Consolidated Vultee plant. Total repair costs for all aircraft involved, Air Force sources said, will come to approximately $100 million by the time all are returned to operational service.

Most of the damage, Air Force said, resulted when the narrow center of a freak tornado producing winds of extreme violence swept without warning across the B-36 ramp at Carswell. The majority of the aircraft received direct wind damage, although some were damaged as a result of flying debris from repair docks and buildings wrecked by the storm. Several small aircraft based at Carswell also were destroyed, including one fighter plane which was airborne by the storm, carried several hundred feet and smashed into the earth. One hangar was completely destroyed.

▶ **125-Mph. Wind**—The three-man general officer team investigating the extent of the damage established the fact that weather forecasts preceding the tornado indicated thunderstorms with wind gusts of 40 to 60 mph. The Air Force said that winds of equal force had previously been experienced at the base without serious damage and that as a result no special precautions were taken. The investigators said that the device for measuring wind velocity was wrecked when the winds reached 91 mph. and that as a result the highest velocity could not be determined although estimates placed it in excess of 125 mph.

The investigating team reported that the 8th Air Force division commander and other officers of the two wings were on duty at the time of the sudden storm and that they had taken "prompt remedial action" to minimize the storm damage. The team reported that, in the manner typical of a tornado, the wind snapped cables and wrecked buildings only a few hundred feet from other buildings which totally escaped damage.

The tornado, they said, developed in a matter of seconds from a thunderstorm just as it reached the air base. Although the storm was tracked to the edge of the base by radar, the crewmen manning the equipment reported that there was no indication of a developing tornado. Freak nature of the storm, the team reported, was indicated by the fact wind velocities at Dallas (less than 30 mi. away), Hensley AFB, Perrin and Ardmore, Okla., during the same period did not exceed 20 mph., although winds did reach approximately 58 mph. at nearby Ft. Worth Municipal Airport.

GM Consolidates Engine, Prop Units

Consolidation of General Motors Corp.'s Aeroproducts division at Dayton with the Allison division at Indianapolis was announced last week by C. E. Wilson, General Motors president.

The Aeroproducts division, which manufactures hydraulically controlled propellers, actuators and other aviation products, will be consolidated as a fifth activity group under the Allison organization, along with aircraft engines, tank engine transmissions, bearings and locomotive parts, all under leadership of E. B. Newill, Allison general manager and vice president of General Motors.

Max Monroe, Aeroproducts general manager, and G. C. Pearce, Aeroproducts general sales manager, will continue in their present work under Newill's direction. The Dayton operation hereafter will be called Aeroproducts-Allison division.

▶ **Coordination**—Newill said the consolidation would facilitate engineering development of both engines and propellers through closer coordination of

MAPLE LEAF C-119 PACKET

Wearing the RCAF maple leaf insignia, a Fairchild C-119 takes off from Hagerstown, Md., on delivery flight. Three C-119s were delivered, two to Canadian Air Transport Command, one for RCAF's Tactical Air Command. They are initial delivery of Packets to a foreign country and first of an undisclosed number for RCAF.

engineers and joint use of test facilities at Dayton and Indianapolis. Some parts and sub-assemblies for Allison engines will be produced in part of the Aeroproducts facilities. The Dayton operation will continue its development of supersonic propellers.

Aeroproducts will continue working with other engine manufacturers on propellers designed to meet their needs, while Allison will continue to work with other propeller manufacturers in matching their propellers with Allison engines.

Higher employment is expected at the Dayton operation in 1953 as production schedules increase, Newill said.

AMC Rejects Plan To Speed Award Data

Dayton—Efforts to speed reporting of information on negotiated contract awards ran into a snag here when Air Materiel Command declined to accept a proposed new method offered by manufacturers' representatives.

AMC indicated, however, that attempts will be made to reduce the time between the award and the announcement. Procurement division officials have pointed out that one new processing system (AVIATION WEEK Aug. 4, p. 255) has resulted in a time saving of approximately 60 days per contract. The saving stems from a form which indicates delays along the line in handling the necessary paperwork prior to mailing the final contract.

The National Association of Manufacturers' Representatives contends:

• **Present system is too slow** to do any good for subcontractors, suppliers or even prime contractors.

• **Inconsistency** among the buying sections—some posting on bulletin boards the low bidder, unit price and contract total immediately after determination is made, while others refuse to divulge any information.

• **Information on unclassified negotiated awards** should be made public as rapidly, after determination, as in the case of formally advertised procurements.

Under the present system of reporting, identity of the awardee, number of units and face value of the contract are forwarded by Contractors Relations Office at AMC to the Department of Commerce for national distribution in the form of a "Synopsis of Contract Award Information." The time lapse runs into weeks.

NAMR proposed a system of sending to Contractors Relations Office an abstract of the low bid as soon as the bidder was proved a responsible producer. The group declared that the change would involve only a small additional clerical cost.

Better Break

- **Boeing president urges tighter defense planning.**
- **He cites complexity of planes, increasing cost.**

Boeing Airplane Co. president William M. Allen in a speech to the American Bar Assn. has issued a plea for better national defense through better congressional and Administration planning and a better break for aircraft manufacturers through:

• **Steady appropriations.** "The armed services have long been forced to operate on . . . a series of 'one year plans.'" Yet the B-29 design work started in 1938, but couldn't drop bombs until six years later in 1944; the B-47 was started in 1943 but the first production model flew eight years later in 1951. Continuity of effort is the first need for improved national defense, Allen says. U.S. plane production went from 9,100 planes a month in March of 1944 to 66 in 1946.

• **Competition** among aircraft companies must depend on product merit.

• **Wages based on productivity** must become the rule, Allen says, whereas in the last seven years manufacturing wages have gained 60% without any corresponding gain in effort. "We should develop wage policies that are an incentive to work." Labor accounts for 49% of total cost of an airframe, he adds.

• **Cost and complexity.** Unit cost of planes has to increase because increased complexity is necessary in modern performance. When two planes close at 600 mph. each, their relative positions change one-fourth mile in the fraction of a second it would take an airman to press the firing trigger. So we "must install a fantastic array of automatic devices."

"In spite of this, we have surprised ourselves by being able to hold the number of production manhours of work per pound in the B-47 down to approximately the number that went into the B-29" because of better tools and techniques and some simplification of the basic airframe structure, Allen says. But in the B-47, for example, the airframe cost reduction per pound has been offset by the avionic equipment, Allen reports.

• **Less bureaucracy.** Allen also calls for simpler government as well as simpler plane design. While the complex aircraft planning requires a heavy administration, it is out of control now, Allen implies. He says, "An aircraft manufacturer has to deal with at least a score of government agencies, each with its own regulations and each with its own requirements for reports from industry. This work alone represents a substantial element of cost in the final product."

• **More private initiative.** Low defense-contract profit margins are forcing government control of plant investment, since the aircraft industry can't lay away savings the way a normal free-enterprise civil industry can, Allen points out. He cites figures: The five leading airframe companies' profit per dollar of sales is 2% over the last ten years, with annual range from 6% loss to 4% profit. But all U.S. manufacturing industry profit margins in the same period ranged from 3% to 8%.

Result: "The really smart manufacturer gets into it (defense) only in time of emergency. . . . But where would this country be if all of us were smart?" Somehow, says Allen, the permanent defense-product companies should be built up to enough financial strength to keep going during the famine years.

• **More guns, less butter.** Allen's final remedy for the presently inadequate preparedness claimed by military authorities is that Congress and the Administration should balance the budget and scarce materials demand. The way it is now, he says, politics is forcing inflation of prices and materials demand—resulting in lower defense output.

CAA Opposes Use of Auto Gas in Planes

Using auto gas for airplane fuel is "inadvisable," Civil Aeronautics Administration reports in a 10-page pamphlet, "Evaluation of Aircraft Engine Fuels and Lubricating Oils," published as a practical guide in their selection and use.

Kenneth S. Cullom of the CAA Powerplants division said CAA has no authenticated tally on who uses auto gas in planes, but "understands" that some fliers do. Three major factors that may tempt people to use auto gas in light planes are:

• **Local unavailability of av gas** at small fields and farms.

• **General shortages**, such as during spring oil strike.

• **Price differential** of about 25 cents an hour in fuel cost for a lightplane.

But the CAA report lists several major objections to using auto gas: excessive lead tetraethyl content, danger of vapor lock, non-standardized anti-knock qualities, and varying composition and volatility. Result can be anything from engine failure due to vapor lock to general conditions of plug-fouling, ring-sticking and valve trouble.

A recent letter to CAA from a plane

owner in Lynchburg, Va., asked if Amoco auto gasoline would not be acceptable due to its having no lead in it. CAA answered that although that would avoid the evils of excessive lead content, American Oil Co. still does not recommend use of that type gas in aircraft engines.

Low-powered planes from the 65-hp. Cub to the 185-205-hp. Beech and Navion class generally specify 80 Grade aviation gas, while the 260-hp. geared Lycoming in the Navion B requires 91/98 Grade.

Pressure Forces AF Action on Spares

Under congressional pressure to reduce spending on spare parts, engines and equipment, the Air Force has set up a committee at Wright-Patterson AFB to recommend appropriate action.

Headed by Harry King of Bridgeport, Conn., president of Munson Line, Inc., the committee expects to make recommendations continuously to reduce USAF's current year program for spares procurement and to make final recommendations re-working the basic system by the first of the year. King has a broad business background, including experience in oil, steel, copper, utilities and in wartime government agencies. He has no previous experience in aviation.

▶ **Funds Restored**—Pressure from Congress to cut expenditures for spares was generated by Undersecretary for Air Roswell Gilpatric's testimony that "60 cents of every dollar spent on original equipment goes into spares. . . . And this is an area in which we feel we must do something" to economize.

The House Appropriations Committee cut funds for the 1953 fiscal year for aircraft procurement by $560 million and the Senate Appropriations Committee by $600 million. Congress felt that USAF could make the saving by reducing procurement of spares and that the cut would not have to be applied to complete aircraft required for the 143-wing program. The funds were ultimately restored to give USAF time to readjust its program.

For the 1953 fiscal year, USAF has earmarked $3.3 billion of its procurement funds for initial spares, compared with $6.5 billion for complete aircraft. Last fiscal year an estimated $4 billion was obligated for initial spares, $4.8 billion for complete aircraft.

▶ **Background**—Congress did not scrutinize the Naval Aviation spares program this year. But it probably will next year, as members seek new ways to economize on the defense budget.

USAF presented this background on its spares program:

- **After World War II,** USAF went too far, events later proved, in disposing of 68,000 aircraft that were on hand and spares to go with them.
- **With the initiating** of the foreign aid program and the outbreak of Korean hostilities, USAF found itself short on spares for its World War II types "and we are now buying certain spare parts to support such aircraft as the B-26, B-29 and F-51 in Korea at comparatively high costs."
- **Procurement money** was so restricted during the five years following the war that spares purchases were held to a minimum and the question of possible over-procurement was "academic."
- **No planes procured** since 1945 have been declared obsolete on the active USAF inventory.
- **Six models** are marked for a phaseout over the next year or two. These are, with an estimate of the value of the spare engine and parts inventory which would become subject to disposal: Grumman SA-10, $14 million; Cessna LC-126, $62,650; Piper L-4, $404,375; Republic F-47, $61.8 million; North American F-82, $31 million; Beech T-11, $18.9 million.

The Boeing B-17, USAF reported, is programmed for use through mid-1955. Spares now in inventory to support B-17s include parts valued at $20 million and 750 Wright R1820 engines representing an investment of $6.7 million.

SWEDISH DELTA RESEARCH PLANE FLIES

Designed and built in only 18 months, the tiny Saab-210 delta wing is now undergoing flight tests. Compared with other deltas, the 210 has wings of extremely low aspect ratio. The craft is powered by a 1,050-lb.-thrust Armstrong Siddeley Adder axial-flow jet engine. Center of gravity can be modified by pumping liquid between the trim tanks in nose and tail. It reportedly is paving the way for design of a larger all-weather delta-wing fighter being considered by the company.

New Air Fares

(McGraw-Hill World News)

Bogota—Avianca, the Colombian government-sponsored carrier, has lowered its freight rates some 10% and simultaneously upped passenger fares approximately 11%. Beginning Oct. 1 the carrier will begin a tourist operation to New York at fares 30% lower than regular service.

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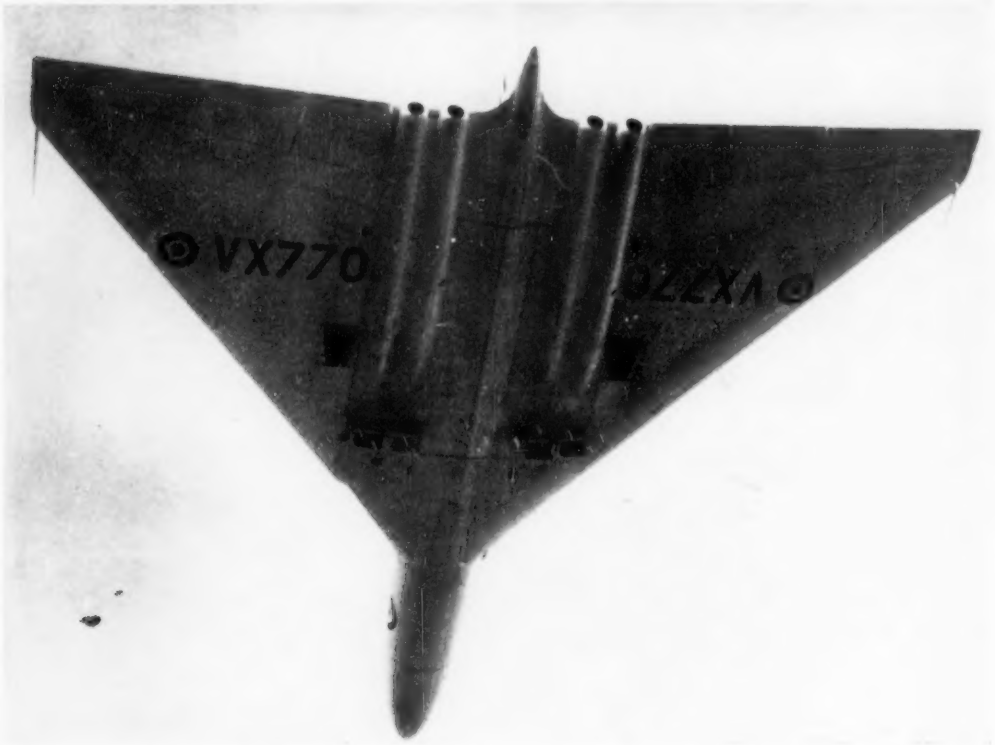


Why British Push the Delta Wing Design

- **You can get low wing loadings favored in Britain, without high drag, only with swept or thin wing.**
- **But thin wing production creates new problems. A filled-in swept wing meets all demands.**

By David A. Anderton

(By Cable to AVIATION WEEK)

Farnborough—Britain didn't get there first with the delta wing aircraft, but she got there with the most. And this carefully considered determination to stress the triangular configuration will have a profound influence on British aviation for years to come.

Four different triangular aircraft flew at the Society of British Aircraft Constructors display this year; only an accident prevented a fifth from showing.

With these and six more deltas known to be in various stages of development here, a wide range of military types has been covered including guided missiles, interceptors, trainers, all-weather fighters and huge bombers.

Interest in the type heightened when Avro announced receipt of a production order—initially estimated at 20 airframes—for its model 698, four-jet delta bomber. And in the background there is talk of a delta wing transport.

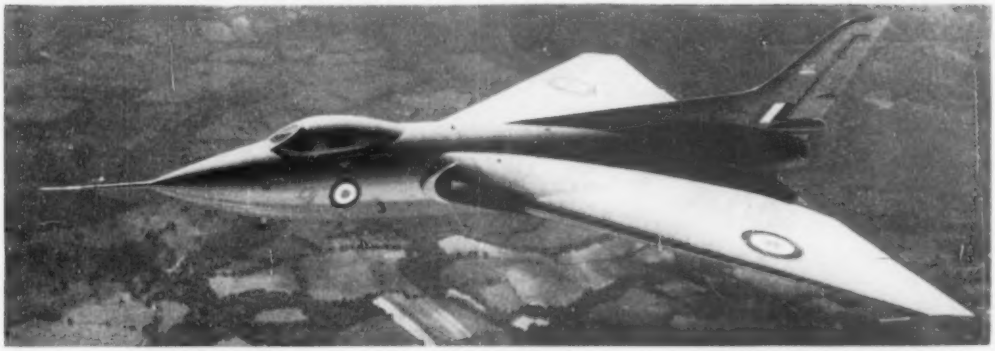
The Planes

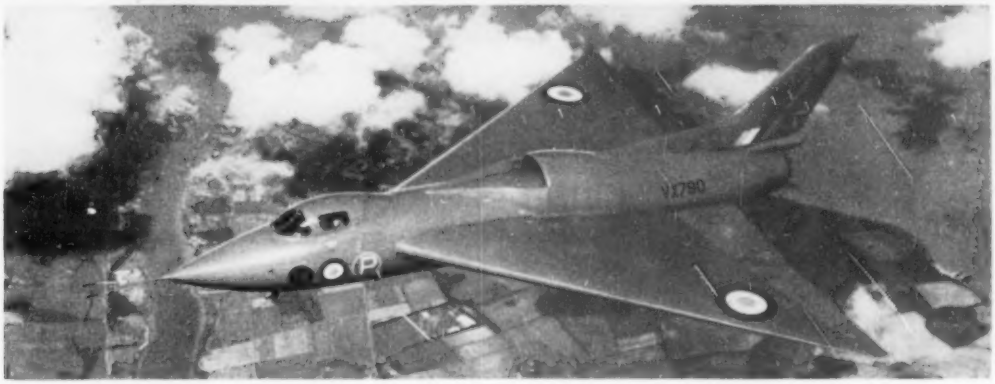
Heaviest participation in the delta program comes from Hawker Siddeley Group companies. They produced the star of the show—a glittering white Avro 698 (photo above)—and its two satellites, the little red 707A and the blue 707B. Avro's 698 bomber first flew Aug. 30. Outside of losing nosewheel turnings, the flight was uneventful and Pilot Roland Falk spent 36 min. in the air.

The 698 is about three times the size of the 707 series; span is estimated at 100 ft., length 120 ft. Powerplants are a quartet of Rolls-Royce Avons, but Bristol Olympus turbojets are to be the engines in the production version.

▶ **Layout**—Control system of the big bomber is like that of the 707, but the elevator is more powerful. Trailing edge surfaces are split; inboard portions are elevators, outboard ailerons. No flaps are used, and there is no horizontal tail. Avons are grouped close in by the fuselage; air intakes on wing leading edge, like those of the 707A, resemble a mail-box slot with a boundary layer separator

From These *(Avro 707A, top; 707B, below)*





Came This *(Avro 698 bomber)*

AVRO 707B, in this attitude, shows clearly how it was used as a flying scale model to test design features of the . . .

AVRO 698 bomber. While configuration of two planes is generally the same, the 707B has air intake at top rear of fuselage.

inboard. Nosewheel has dual tires; main gear is bogie type with eight wheels per leg.

Eight air brakes are fitted, four above and four below the wing, paired on each side. There is no indication of armament or provision for gunlaving radar, hinting that perhaps the British are going to depend on speed and altitude for protection.

Bomb bay is extremely long and quite wide, promising huge capacity. The cockpit equipment includes ejection seats for the crew.

► **Power and Potential**—Gloster Aircraft, another company in the Hawker Siddeley Group, demonstrated its G.A.5 Javelin, world's first twin-engine delta fighter. Designed for all-weather interception, the Javelin is jam-packed with avionics equipment. Two Armstrong Siddeley Sapphires will thrust the plane along at supersonic speed.

Gloster claims the plane is more maneuverable at lower speed than any fighter since the biplane era. This characteristic, coupled with the carrying capacity and the development potential in both airframe and engine, led Gloster to state that ". . . the Javelin offers infinitely more than any other fighter."

The Javelin is about one-half the size of the Avro bomber, with a span of 52 ft., length of 57 ft. and overall height of 17 ft. It mounts a horizontal tail, as a guarantee of spin recovery, on a low-aspect ratio vertical fin and rudder. A large fairing at the top of the fin houses a drogue parachute.

► **How They Fly**—Roland Falk and Bill Waterton, test pilots of the 698 and Javelin, respectively, agree that if a pilot can fly the Anson (a small twin-engine Avro trainer) he can fly a delta. Falk has been flying the big bomber

WING PLAN of 698 bomber is plainly evident in this view. Inboard control surfaces are elevators, outboard are ailerons.

REAR VIEW of 698 gives deceptive appearance of smallness. Dark lines near leading edge are air brakes.

alone, although there are accommodations for other crew members.

Judging by the Farnborough exhibitions flight characteristics of the deltas are normal and maneuverability exceptional. As the show passed through successive days, and Falk and Waterton began to let out their mounts more, performance was even more impressive. Foreign visitors noted how the big bomber ran away from the little deltas and gasped when Waterton banked the Javelin off the runway in a tight turn after takeoff.

► **Others in Works**—Avro now is developing a series of two-seat delta trainers to familiarize pilots with the capabilities of that geometry. Not as well publicized as the Hawker Siddeley Group deltas are experimental deltas built by Fairey Aviation and Boulton Paul.

• **Fairey** announced its FD1—a development project leading to a rocket-propelled interceptor with ramp launching—just before last year's SBAC display but did not fly the craft then nor this year. In the firm's static exhibit was a small pilotless rocket-propelled, autopilot-controlled aircraft with the general lines of the FD1.

• **Boulton Paul's** PX111, which gave a convincing demonstration of flight performance last year, failed to show this time. The firm's newer PX120, basically a PX111 with the addition of a horizontal all-movable tail mounted on a modified vertical tail, crashed a few days before the display.

The Theory

Behind the British industry's apparent preoccupation with a single idea lies logical thinking which evolved the delta as the type most fitted to do cer-

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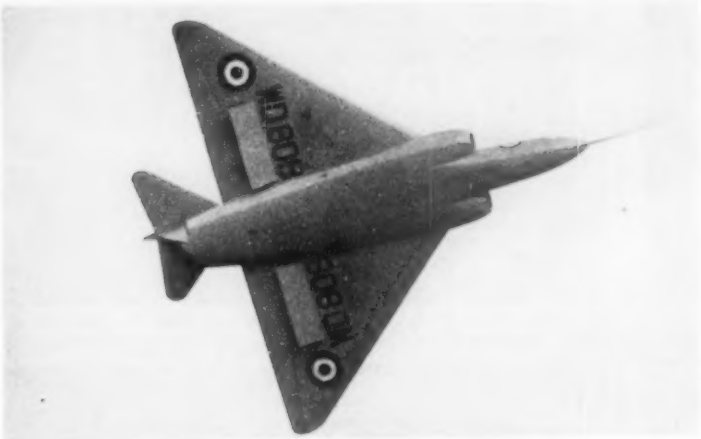
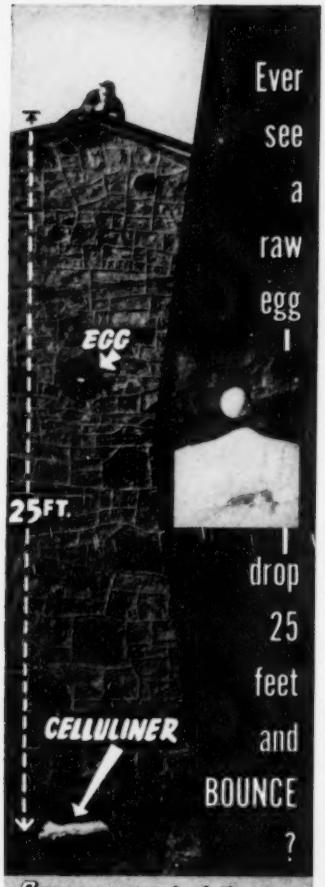


Three Views

of Gloster Javelin show the general lines of the delta fighter which vied for interest at the SBAC show with the Avro delta bomber. (Photos of bomber on preceding pages; more photos of Javelin following. Story on both planes begins on page 22.)



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JAVELIN turns and climbs at takeoff in astonishing display of its maneuverability.

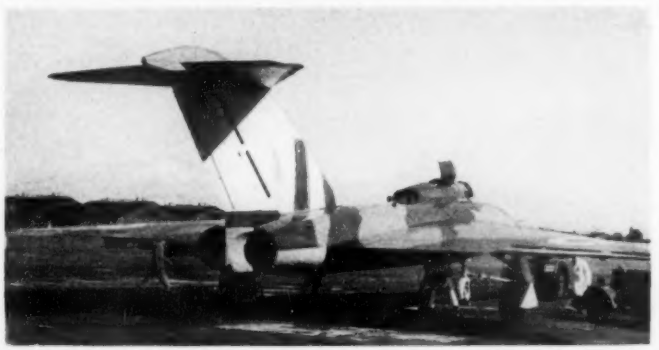
tain jobs. Avro planning began in 1947 when the Air Ministry and the Ministry of Supply asked the company to study specifications for a bomber design. These studies convinced Avro that the delta layout was the only shape which would meet the tough requirements of the specification.

▶**Problems and Answers**—Generally, Avro claims the delta is the answer to the problem of producing a high-speed, long-range load carrier. Specifically, most arguments for the type stem from either manufacturing problems or aerodynamic requirements.

Traditionally, British aircraft designers have favored low wing loadings. Even jet engines and high-speed flight have never shaken them from that position. But low wing loading means large wing area, which in conventional airplanes means high drag. There is only one way to reduce wing drag, discounting area changes and use of special devices: make a thinner wing.

Sweepback, which reduces aerodynamic thickness in direction of flow, is one way to do the job; a very thin straight wing is another. But the wing has to be strong to take loads of high-

BUSINESS END of Javelin carries radar and armament. Solid lid, opened behind pilot's canopy, is enclosure for radar operator. Plane is refueled through underwing ports.



JAVELIN TAIL design reflects special problems of delta craft. Horizontal tail, needed for maneuverability, has controllable incidence and normal elevators.

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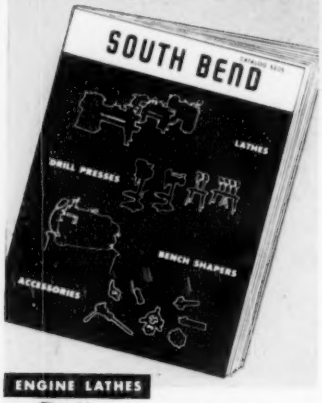

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BOULTON PAUL P. 120 crashed before it could be displayed publicly at Farnborough.

speed flight, and stiff so that flutter does not develop. The wing may have to carry fuel, landing gear and equipment. Air inlets may eat into the structure.

These requirements add up to a wing which is thin, yet thick and highly swept. Currently, the only configuration which meets those contradictory needs is the delta wing.

A delta wing can be made structurally thick, and therefore still aerodynamically thin because thickness chord ratio is inherently low. Leading edge ducting serves to reduce further the aerodynamic thickness. The delta can be thought of as a sweptwing plan with the trailing edge portion filled in.

The Result

One other big argument for British acceptance of the delta wing is ease of fabrication by an industry unable to afford expensive machinery and tooling. Standard airframe construction with frames, skin and stringers is directly applicable to triangular layout whereas sweptback or thin wing requires specialized heavy machines. Sir Roy Dobson, Avro chief, foresees no particular problems in building deltas. Avro's estimates, says Sir Roy, showed that the 698 could be built with not many more manhours than required by World War II's Avro Lancaster four-engine bomber.

► **To Prove a Point**—For those reasons, Avro decided the delta was it for a bomber, and began design studies. Avro's first claims for the plane were somewhat revolutionary, Sir Roy says, so the Ministry of Supply ordered a series of three Avro 707 research planes to substantiate the claims. Flight tests of these planes, beginning in the summer of 1949 and still continuing, has produced a wealth of aerodynamic data of the type.

Handling characteristics and powerplant performance were pre-proven by these research craft. There also was a dividend in the pilot training.

So a fundamental technical decision to back deltas heavily has been made in British aviation. It may prove as important as an earlier decision to produce two similar low wing monoplane fighters which later were named the Hurricane and Spitfire.

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Time required to heat from ambient to 200F is 60 min. It takes from two to three hours to drop from ambient to minus 100F.

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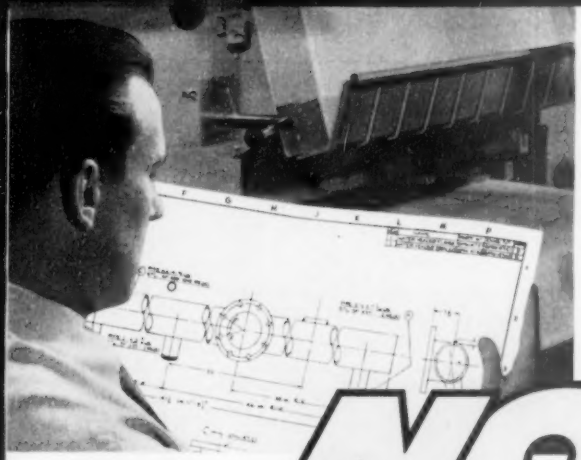
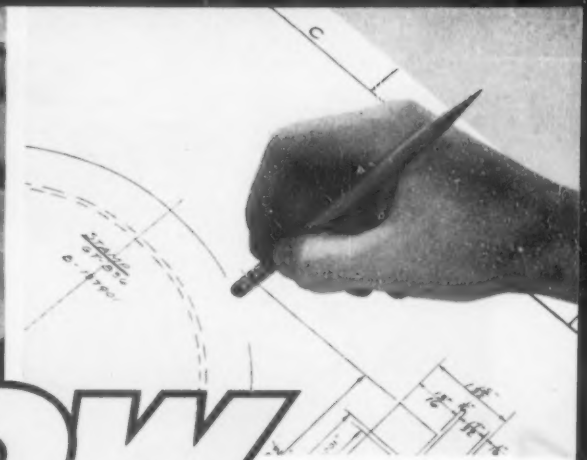
Special features may be obtained when required. These include special instrumentation, temperatures down to minus 150F and altitudes to 120,000 ft. Special size requirements also can be filled.





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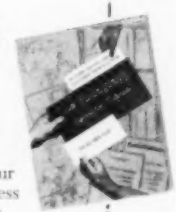

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NAMR BOARD, left to right: Herbert C. Thomas, Everett D. Farr (chairman), John E. Epps, Paul H. Hussey, and John A. Lombard.

NAMR OFFICERS: Secretary Ruth Gerhardt, President Louis J. Sculley, Treasurer Robert G. Siff. Vice President D. D. Brubaker was absent when photo was taken.

Growing NAMR Broadens Scope

Dayton representatives group, hardly a year old and already largest of kind, now seeks national role.

Formed a little more than a year ago in Dayton to handle common problems of company representatives at the Air Materiel Command, the National Association of Manufacturers Representatives already is the largest organization of its kind in aviation and is bidding for recognition as the spokesman of representatives in all types of industry.

Its membership is approximately 250 and includes representatives in Washington, New York, Cleveland, Chicago, Detroit and the West Coast as well as in Dayton.

Although its future aims are national in scope, NAMR right now is still pretty much of a Dayton proposition. That is where most of the aviation business is done and that, naturally, is where most of the problems lie. NAMR's job, and its future growth have to be assessed against the background of the role of a representative at Dayton.

▶ **What a Rep Does**—Wright Field representatives, whether representing large or small business, perform the following functions for their clients:

- Select military products suitable for manufacture by client.
- Register firm on source lists.
- Keep abreast of new developments.
- Maintain liaison with research project engineers.
- Scan all new procurements, and procure bid forms, specifications, and drawings if not already forwarded to firm.
- Delve into previous purchase history of item to guide firm in bidding. Advise firm on bid procedures.
- Follow up bids and proposals, and advise firm as to status.
- Find out sources for purchased items, and find suitable subcontractors.
- Advise client, and assist in any contract negotiations.
- Advise client regarding accounting procedures in segregating costs for price redetermination and negotiation.
- After contract is obtained, maintain liaison with buyer and project engineer regarding any subsequent changes, production problems, inspection problems, etc.
- Follow up qualification test samples in engineering laboratories.
- Expedite payment of invoices by finance officer.
- Keep tabs on large prime contracts awarded, regarding possibilities of obtaining a subcontract.
- Keep firm name fresh in buyers mind, to avoid being overlooked on any procurement.
- Carry to higher authority an appeal on any arbitrary decision made at lower levels, which seems unjust or prejudicial to clients interests and the "best interests of the Government."

▶ **Legitimate Service**—Contrary to adverse publicity in several Washington scandals, the Wright Field representative is not an influence peddler, confidence man, or political fixer, for the reason that there is very little politics involved in most Air Force procurements. On the contrary, he performs a legitimate service; otherwise industry would not maintain his services.

He performs two functions: He is supposed to keep his eyes open for new business; and he is supposed to service the business already on hand. Representatives' fees generally are geared to the size and bidding activity of the account. On this score, you generally get about what you pay for. Hundreds of reps located in or near Dayton either have years of experience in procurement, engineering or supply with the Air Force, or as manufacturers' representatives.

Many possess engineering degrees of one type or another. But the principal stock in trade is a general savvy of the many ramifications attendant to purchase of equipment and services by AMC.

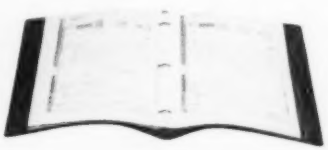
▶ **New Stature**—Two recent developments have pointed up a new stature for reps.

- They are recognized legally by the Renegotiation Act which provides that

"special" *treatment for* standards

No presentation of Cooper production would be complete without an exhibit of current AN and NAS standard threaded aircraft fasteners. This company is a large producer of "standards" as well as of all types of quality fasteners. Many of today's "standards," in fact, we first worked on when they were "specials." This wide variety of production is also responsible for creating the *habit of accuracy* which is indispensable to mass precision production. Standards get "special" attention at Cooper *—it's standard.*

Catalog F-4 on request including a file of current MIL, AN, and NAS fastener specifications.



COOPER Precision Products

PERFECTIONISTS IN THREADED FASTENERS FOR AIRCRAFT

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individuals–as well as companies–can be subject to renegotiation. Any representative who earns $25,000 or more from his activities on government contracts is subject to the terms of the act.

• Reps in general are held in growing esteem by AMC officials. Certainly part of this feeling is due to the National Association of Manufacturers Representatives. Veteran members of NAMR recently were asked by top AMC officials to offer advice whenever asked by new procurement assignees, particularly officers recalled to active duty. Although most of those recalled will have had past procurement experience, procedural changes since their previous tours may handicap them while they break into the job again.

▶ **Parking Victory**–One accomplishment of NAMR was the establishment of a parking lot for reps and contractors across the highway from the Reception Center at Area B. The lot is adequate in size, restricted to reps and contractors and close enough to the Area B entrance to solve a long-irritating situation.

Another recent development was the decision to post late bids in the Contractors Relations Office. The practice had been stopped, working a hardship on reps and contractors alike. During inclement weather, many legal bids are late by reason of mail failures. If the postmarks indicate that the bid should have been delivered to AMC under normal mailing conditions, it is declared to be an acceptable late bid.

But during the suspension of the posting of late acceptable bids, a responsible bidder could attend the bid opening, hear his bid read as low, and yet not know that he would get the bid because of the possible late bids which might be under his quotation.

After a complete exchange of opinions on the practice, the posting of late bids has been resumed.

Although membership of NAMR is still mainly a Dayton proposition, many outside plant officials belong and time their business trips to be on hand for meetings (generally the first Wednesday of the month). Headquarters is in the Van Cleve Hotel, Dayton.

▶ **Officers**–This year's officers:

• **President:** Louis J. Scullev.

• **Vice President:** D. D. Brubaker.

• **Treasurer:** Robert G. Siff.

• **Secretary:** Miss Ruth Gerhardt.

• **Board of Directors:** Everett D. Farr (chairman), Herbert C. Thomas, John E. Epps, Paul H. Hussey, John A. Lombard.

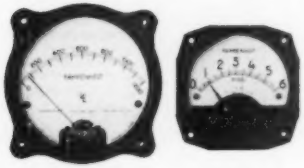
• **Committees:** AMC-WADC liaison, Russell F. Hardy; program and entertainment, Grant V. Disbro; finance, D. D. Brubaker; rules, Everett D. Farr; membership, Kurt W. Schmidt; parking and facilities, Fred J. Kendell; press, radio and television, Byron C. Dempsey.

LEWIS
Indicating Pyrometers

for temperature testing in the laboratory or in the plane...

Constructed with the same care as our aircraft temperature indicators, these pyrometers bring "aircraft quality" to the test engineer.

MODEL 58PY, above, has been used extensively by leading motor car manufacturers for road testing on the "Proving Grounds" — where performance counts. Housed in rectangular bakelite case, has 6" hand drawn scale and is fully compensated for ambient temperature. Made in ranges listed below, with suitable thermocouple materials.



MODEL 23B, left above, has same type movement as our aircraft pyrometers. Housed in flanged, 4" round, bakelite case for panel mounting.

MODEL 20B, right above, has same 3" steel case and same movement as our aircraft panel indicators. Both are fully cold-end compensated and available in standard ranges listed, with suitable thermocouple materials.

STANDARD RANGES—All Models

FAHRENHEIT

Zero to 400, 600, 800, 1000, 1200, 1600, 1800, 2000 and 2500.

CENTIGRADE

Zero to 200, 300, 400, 500, 600, 800, 1000, 1100 and 1400.

Furnished with white scales, black markings and pointer or, with black scales white markings and pointer if specified. For best results use LEWIS Thermocouples, Leads and Selector Switches with these instruments.

THE LEWIS ENGINEERING CO.

Manufacturers of Complete Temperature Measuring Systems for Aircraft

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14 colors!

Masking Tapes for every application

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Mystik Protecto-Mask®

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Mystik Sand-Blast®

Mystik Dri-Pipe® Insulation

The most expensive tools in your plant are *hands*. Daily they perform thousands of operations. But how many of those operations can be performed with MYSTIK Brand Tapes? A roll of "self-stik" MYSTIK Brand Tape is really a roll of *hands* . . . countless fingers that grasp, grip, hold . . . performing countless holding jobs in every phase of operation—storage, fabricating, assembling, shipping.

MYSTIK is the world's largest maker of "self-stik" cloth, waterproof tapes . . . available in *fourteen* colors . . . makes a full line of cloth and masking tapes and adhesive products to help you cut operational costs.

Write for information and samples.

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John B. Huarisa, Executive Vice President of Admiral Corp., says—

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require a Specialist's Attention

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Flying Tigers

CORRECT, MR. HUARISA. THE FLYING TIGERS HANDLE AIR FREIGHT ONLY. IT ALWAYS FLIES FIRST CLASS WITH US!
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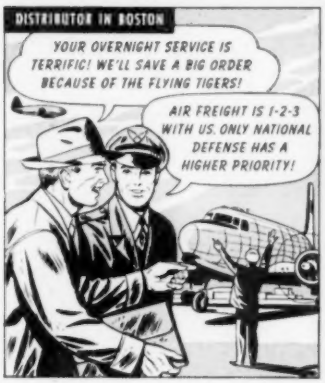
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Insulation for a Scorpion!

REFRASIL is on the job here...

This bolt of flame from the afterburners of the U.S. Air Forces' Northrop Scorpion F-89 is spectacular evidence of the intense heat generated by jet power. Refrasil Blankets are used on the F-89's twin-engines because they are light in weight and are easily removable, as well as high in insulation efficiency. In a blanket thickness of one half inch, a temperature drop of approximately 900° F. is accomplished! These are reasons why Refrasil Lightweight Removable Insulation Blankets are specified by 90% of jet aircraft makers.

Refrasil Insulating Blanket installed preformed on the J-35 Turbojet engine's air bleed manifold lines.

Refrasil Insulating Blankets installed on the air bleed manifold lines and afterburner of the J-35 Turbojet engine.

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Refrasil is available in a variety of forms to help solve your high temperature problems. Attach this ad to your letterhead and mail today for illustrated literature.

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THE H. I. THOMPSON COMPANY
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High Production Credited to Subs

A six-times increase in output of aviation instrument and other precision devices compared with pre-Korea production is reported by Eclipse-Pioneer division of Bendix Aviation Corp., Teterboro, N. J. Fully one-third of this increase is credited to the efforts of the firm's 132 subcontractors.

It is estimated that subs will be topping Eclipse-Pioneer's own production by the end of the year. Some of the subs formerly made knitting machinery, fishing rods and reels, expandable watch bands, vacuum cleaners and other consumer goods. Now they're helping turn out radar antenna bases, aircraft navigation sextants, rate-of-climb indicators, fuel flow meters and other critical items.

The Bendix division's government backlog is $245 million. Currently the firm is utilizing 22 complete unit subcontractors, 110 parts subs and about 2,000 vendors. Approximately 85% of these firms are in the small business category.

Eclipse-Pioneer credits part of its success with outside contractors to its team of expert ex-machinists, with 10-15 years top-level shop experience, who work actively with the subcontractors in demonstrating the required production skills and know-how.

Current E-P output is scheduled to more than double over the next two years and reach a rate 15 times that of pre-Korea.

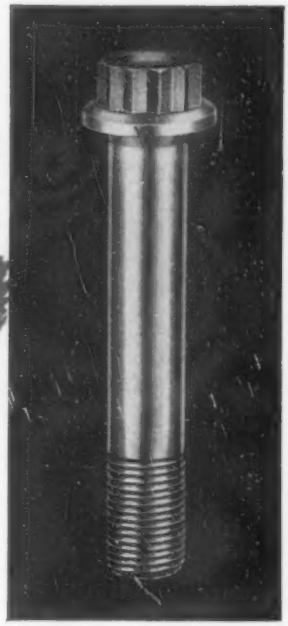
PRODUCTION BRIEFING

▶ **Northrop Aeronautical Institute,** Northrop Aircraft, Inc., Hawthorne, Calif., has been awarded a contract by the Ordnance Corps to set up a training school for guided missile personnel at Redstone Arsenal, Huntsville, Ala.

▶ **Pacific Airmotive Corp.'s** Chino, Calif., base will overhaul approximately 100 Douglas C-54s under USAF contract. Initial dollar value is $2.8 million, but will probably be increased to $5 million.

▶ **Plomb Tool Co.,** Los Angeles, has started construction of a plant in London, Ontario, Canada, to house a new facility to be known as Proto Tools of Canada, Ltd. Building is scheduled for completion in September.

▶ **Ryan Aeronautical Co.,** San Diego, has received $7-million worth of orders for airframe and engine components, bringing its backlog to more than $70 million.



It's a BOLT!

The newest addition to the growing Voi-Shan family of fasteners is one of the aircraft industry's latest developments . . . the *high tensile* 12-POINT EXTERNAL WRENCHING BOLT. Here are its important advantages:

- ★ Reduced weight for equivalent strength allowables
- ★ Permits higher torque loads in installation and removal
- ★ Less stripping in removal of seized bolts
- ★ Can be used with standard socket wrenches

Pending release of National Standards, Voi-Shan is ready to furnish 12-Point External Wrenching bolts to your specifications or to our own drawings.

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USAF CONTRACTS

Following is a list of recent USAF contracts announced by the Air Materiel Command.

Elastic Stop Nut Corp. of America, 2330 Vauxhall Road, Union, N. J., self-lock nuts, $210,175; nuts, 2,361,200 ea., $28,513.

Electrolux Corp., 51 Forest Ave., Old Greenwich, Conn., dynamotor unit, $48,865.

Electronic Brazing Co., 140 Glenridge Ave., Montclair, N. J., indicator assy., 2536 ea., $64,414.

Emerson Elec. Mfg. Co., 8100 Florissant Ave., St. Louis, air circulating fan, 23,400 ea., $465,660.

Fafnir Bearing Co., New Britain, Conn., ball bearings, $39,811.

Fairchild Camera & Instrument Corp., 88-06 Van Wyck Blvd., Jamaica 1, N. Y., K-38 camera, 1,249 ea., $500,000.

Fine Organics, Inc., 211 East 19th St., New York, carbon removal compound, 33,337 gal., $44,005; compound, cleaning, 400.150 gal., $254,896.

Firestone Tire & Rubber Co., 2525 Firestone Blvd., Los Angeles, fuel cell fittings, $41,392.

Flexible Tubing Corp., New Whitfield St., Guilford, Conn., flexible duct, 4,900 ea., $81,147.

Florida Fishing Tackle Mfg. Co., Inc., 2700 First & South St., Petersburg, Fla., fishing kits, 6,850 ea. $26,030.

Franklin Steel Co., 5725 South Broadway, Los Angeles, Wright engine parts, $58,803.

FR Corp., 951 Brook Ave., N. Y. 56, photographic chemicals, $57,720.

Frederick Gade, Norton, Conn., resistor assembly, $25,000.

Gadgets, Inc. 3629 N. Dixie Drive, Dayton, pump assy., $46,583.

Garwood Industries, Inc. Wayne, Mich., fabrication of spare parts, $30,382.

General Electric Co., Dayton, regulator, 511 ea., $717,339.

General Electric Co., Schenectady, N. Y., indicator, 15,515 ea., $1,553,086.

General Electric Co., 1 River Rd., Schenectady, starter-generators, 191 ea., $231,280.

General Tire & Rubber Co., 1708 Englewood Ave., Akron, wheel assembly, $76,612.

Golden State Co., Ltd., dba Los Angeles Auto. Works, 1020 Towne Ave. Los Angeles, aircraft jack, axle, 133 ea., $29,943.

B. F. Goodrich Co., 803-4 Winters Bank Bldg., Dayton, wheel assemblies, 281 ea., $46,738.

Goodyear Tire & Rubber Co., Inc., 1144 East Market St., Akron, wheel assemblies, 282 ea., $36,648; wheel & brake assembly, $672,646; aircraft hose, $31,231.

C. H. Gosiger Machinery Co., Dayton, grinders, 79 ea., $307,629.

Grant Photo Products, Inc., 18915 Detroit Ave., Lakewood, Ohio, photographic paper, $32,855.

Hackensack Cable Corp., 110 Orchard St., Hackensack, armored steel tow target cable, 25,025,000 ft., $700,700.

Haloid Co., 2-20 Haloid St., Rochester, N. Y., photographic paper, $283,674.

Handley Brown Heater Co., 2501 Brooklyn Road, Jackson, Mich., rack assy., $1,383,655.

Hanson-Van Winkle-Munning Co., Matawan, N. J., plating barrel, 33 ea., $26,664.

Hercules Motors Corp., 101-11th St., S. E., Canton, Ohio, spare parts, $336,048.

Howard Steel Fabricating Corp., 1st Federal Bldg., Kokomo, Ind., structural steel plate, 2,431 tons, $397,629.

Philip A. Hunt Co., foot of Roosevelt Place, Palisades Park, N. J., photographic fixer, $29,532.

International Engineering Co., 1145 Bolander Ave., Dayton, base plate assembly, $36,420.

International Hardware Mfg. Co., 9765 Erwin Ave., Detroit, cable assembly, 4,667 ea., $76,889.

International Television Corp., 238 William St., N. Y., frequency meter, 634 ea., $176,089.

Jack & Heintz, Inc., Cleveland, spare parts, $139,558.

Johnson Engr. & Equip. Co., 1089 E. Broad St., Columbus, Ohio, benches, 570 ea., $59,252.

J. H. Keeney & Co., Inc. 2600 West 50th St. Chicago, antenna loading coil, $172,923.

Kohler Co., Kohler, Wis., valve assys., $37,065.

Lamson & Sessions Co., 1971 W. 85th St. Cleveland, cotter pin, $75,641.

Lear, Inc., 110 Ionia Ave. N. W., Grand Rapids, Mich., spare parts, $143,423.

Leece-Neville Co., 5109 Hamilton, Cleveland, spare parts, $53,248.

K. L. LeBlond Mach. Tool Co., Cincinnati, lathes, 6 ea., $41,676.

Leland Elec. Co., 1501 Webster St., Dayton, 3-phase inverters, 549 ea., $241,040; inverters, 366 ea., $130,128.

Lempoo Products, Inc., 5490 Dunham Rd., Bedford, Ohio, reamers, & blades, 25,294 ea., $238,358.

Lewis Eng. Co., 339 Church St., Naugatuck, Conn., temperature bulb, 6,201 ea., $65,279.

Libby-Owens Ford Glass Co., Toledo, spare parts, $125,336.

Lincoln-Schlueter Floor Mach. Co., 1250 W. Van Buren St., Chicago, floor polishing machinery, 500 ea., $68,775.

Lincoln Industries, Inc., Marion, Va., radome, $72,459.

Magnavox Co., Fort Wayne, components of radio set, 9,000 ea., $15,230,008.

Malone Camera Stores, Inc. 30 N. Main St., Dayton, anhydrator, 20 ea., $32,951.

C. H. Masland & Sons, Spring Road, Carlisle, Pa., stabilizer covers, $136,236; flying trousers, 21,427 pr., $418,683; stabilizer covers, wing covers, $28,026.

Mechanical Prod., Inc., 1824 River St., Jackson, Mich., circuit breakers, $208,043.

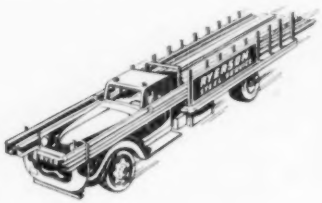
McPhillips & Co., Inc., 235-39 Bernard St., Trenton, N. J., band, spring, parachute pack, opening, $25,500.

Michigan Power Shovel Co., Benton Harbor, Mich., spare parts, $73,135.

RYERSON

Ryerson Steel Service awaits your call at fifteen great plants, strategically located for quick delivery anywhere.

STEEL



Both aircraft and standard analysis alloy and stainless steels are on hand as well as a wide range of carbon steel products. Though some sizes are still occasionally out of stock, most requirements are usually available.

SERVICE

Ryerson representatives are ready to assist you on any problem involving the purchase, fabrication or application of steel. Just call your nearest Ryerson plant.

PRINCIPAL PRODUCTS

AIRCRAFT ALLOYS—bars, sheets, strip. Over 400 sizes, finishes and conditions.

AIRCRAFT STAINLESS—Bars, sheet, trip. Over 300 kinds and sizes in stock.

CARBON STEEL BARS—Hot Rolled and cold finished.

STRUCTURALS—channels, angles, beams.

SHEETS—Hot and cold rolled.

PLATES—Many types, including 4-Way Safety Plate, E-Z Cut, etc.

TUBING—Seamless, Welded, mechanical, boiler tubes.

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JOSEPH T. RYERSON & SON, INC. Plants At: New York • Boston • Philadelphia Cincinnati • Cleveland • Detroit • Pittsburgh • Buffalo • Chicago Milwaukee • St. Louis • Los Angeles • San Francisco • Spokane • Seattle

One or more of these PET Superduty Models will EXACTLY meet any drill user's needs!
48 Superduty ¼" Models—8 speeds, from 500 to 5000 R.P.M. Choice of pistol or saw-type grip.
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3 Superduty ⅜" Models, 400 to 1000 R.P.M.
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Now... Get EXACTLY the drill you need!

No longer is it necessary for you to compromise on an electric drill that's "almost" right for your job.

The three PET Superduty Drills you see above are typical examples of a complete line of 54 industrial drill models—*each with separate and distinct operating ranges.*

Complicated? Not a bit! It simply widens your choice . . . gives you a chance to select the PET drill with the *exact* characteristics you need in maintenance or on your production line. Naturally that means more efficient work and longer drill life.

As for quality, there isn't a finer drill made! Every PET drill is built for rugged, *continuous* duty. Features such as dynamically balanced armatures, precision-cut gears and ample reserve power are *standard;* not "optionals" that build up the cost. Control of every manufacturing step, including production of our own motors and die castings, assures uniformly high quality of every PET product.

And, *the price is lower than you think.* If you want the best in electric drills . . . a selection that's wide enough to give you exactly the drill you need . . . get the facts on PET Superduty Drills!

Write for this FREE catalog

It's packed with information and specifications on PET drills, bench and hand grinders, sprayers, accessories. Here's a catalog you'll want to study from cover to cover! Write for Catalog and name of nearest distributor, to Portable Electric Tools, Inc., Dept. AW-92, 320 West 83rd St., Chicago 20, Illinois.

The features you want are the features you get—in PET Superduty Drills

- Reserve Power; for the extra-tough job
- Heavy-Duty ball and needle bearings
- Precision-Cut, Heat-Treated Gears; for smooth, quiet power flow
- Dynamically Balanced Armatures; for freedom from vibration
- Forced Ventilation; for cool running
- Aluminum Alloy Die Castings; for light weight, easy handling
- Compact Design; makes hard-to-reach drilling jobs easier and faster
- Meet U. S. Government and Military Specifications

PET POWER TOOLS

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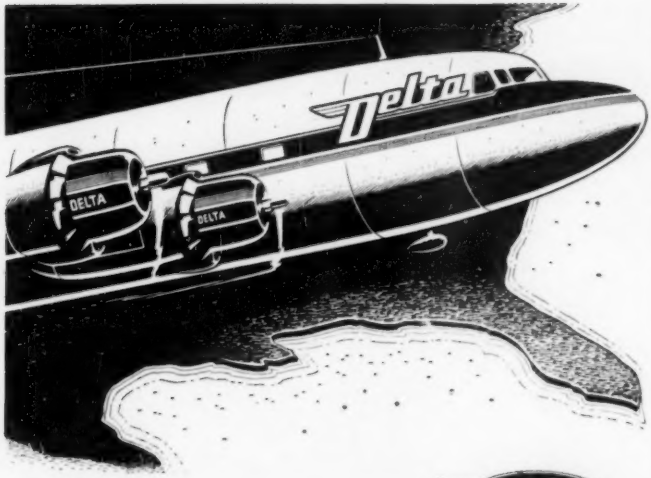

DELTA*

Delta AIR LINES

The Fleet of Proven Ability

The Delta story is one of continuing growth and expansion. Delta inaugurated passenger service in 1929, flying from Dallas, Texas to Atlanta, Georgia. In 1934 Delta won a mail contract and graduated from 90-mph Travelaires to tri-motored Stinsons which carried seven passengers and flew at 100 mph. A year later night flights were begun between Atlanta and Fort Worth. In the years that followed, Delta expanded rapidly —1936: Lockheed Electras were put into service . . . meals were served during flight . . . 1940: Delta progressed to DC-2's and DC-3's . . . registered nurses were added as stewardesses . . . 1943: the CAB certified a new route between Fort Worth and New Orleans, then from Cincinnati to Chicago, from Knoxville to Charleston, from Savannah to Miami. Today with the addition of a modern fleet of DC-4's and DC-6's, the Delta planes fly over 400,000,000 revenue passenger miles a year. Every ship in this fleet of proven ability uses Bendix Radio equipment . . . it has been the choice of Delta since 1940.

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most Trusted name in **Radio**

VHF Transmitters • H. F. Transmitters • Radio Control Panels • Antennas • Indicators • Automatic Radio Compasses • Marker Beacon Receivers • Announcing Systems • VHF Communication and Navigation Receivers • Intercommunication Systems • H. F. Receivers • Ground Controlled Approach Landing Systems • VHF Omni-Directional Range Systems.

Mine Safety Appliances Co., Braddock, Thomas & Meade Sts., Pittsburgh, hood assembly, $33,932.

Minnesota Mining & Mfg. Co., 411 Piquette Ave., Detroit, cement base, 72,000 qt., $58,320; gen. purpose cement, 48,000 qt., $38,880.

Minneapolis Honeywell Regulator Co., Minneapolis, special tools, $112,967.

C. W. Morris Co., 10628 Cloverdale Ave., Detroit, wire brushes, 46,650 ea., $25,006.

Morrison Railway Supply Corp., P. O. Box 183, Station F, Buffalo, roller conveyors, 32,798 ea., $841,789.

Mueller Bass Co., 1925 Laper Ave., Port Huron, Mich., bronze, aluminum rod, 107,200 lb., $54,514.

National Products Co., 725 Taylor St., Grand Haven, Mich., bench, 200 ea., $26,015.

Neptune Electronics Co., 433 Broadway, N. Y., filter, $345,035.

Herman Nelson, Amer. Air Filter Co., Inc., Moline, Ill. heaters & spare parts, 57 ea., $39,516; heaters—spare parts, $1,076,024.

North American Aviation Inc., Columbus div., Columbus, Ga., hoisting inst., consisting of beam cable, bolt assys., $44,408.

Nutt-Shel Co., 811 Air Way, Glendale, Calif., nuts, 161,300 ea., $35,507.

Olympic Radio & Television, Inc., Long Island City, amplifier, 5,403 ea., $1,450,000.

Pacific Scientific Co., 1430 Grande Vista Ave., Los Angeles, tensionmeter, $39,768.

Phelps Dodge Copper Prod. Corp., 40 Wall Street, New York, wire, 77,352 lb. $26,591.

Philco Corp., C and Lloga Sts., Philadelphia, line transfer switch, $29,119.

Philips Petroleum Co., Special Products div., Bartlesville, Okla., N-Heptane, 348,581 gal., $264,922.

Piasecki Helicopter Corp., Norton, Pa., mobile training unit, $75,000.

Pittsburgh Plate Glass Co., Pittsburgh, spare parts, $466,295.

Rapids Std. Co., Inc., Grand Rapids, Mich., roller conveyors, $32,798 ea. $836,274.

Raybestos-Manhattan, Inc., Manhattan Rubber div., 61 Willett St., Passaic, N. J., aircraft hose, $37,130.

BIG BLOCK

This huge die block is a hint of the even bigger units to come for complementing the 25,000-, 35,000- and 50,000-ton forge presses scheduled for the Air Force's heavy press program. This block, produced by Heppenstall Co., Pittsburgh, Pa., measures 12 ft. long, 6 ft. 10 in. wide and 13 in. thick. Material is Hardtem, a special alloy developed by Heppenstall.

Recordak Corp., 444 Madison Ave., New York, photographic film, $31,804.

Reliance Varnish Co., 4730 Crittenden Dr., Louisville, Ky., carbon removal compound, 14,849 gal., $188,304.

Remington Rand, Inc., 20 N. Jefferson St., Dayton, photographic paper, $29,423.

J. C. Rendler Co., 3216 So. Hill St., Los Angeles, conduit, $46,785.

Riverside Metal Co., 1 Pavilion Ave., Riverside, N. J., phosphor bronze rod, 112,150 lb., $72,412.

Schwien Eng. Co., 16217 Lindberg St., Van Nuys, Calif., indicators, 9,307 ea., $686,536.

Scintilla Magneto div., Bendix Aviation Corp., Sidney, N. Y., spare magnetos, wiring harnesses & spare parts, $991,166.

Seifreat Elstad Mach. Co., Dayton, metal working shaper, 10 ea., $65,702.

Sheffield Steel Corp., Sheffield Station, Kansas City, Mo., commercial hardware, $92,206.

Sheldon Machine Co., Inc., Chicago 41, lathes, 60 ea., 109,946; lathes, engine 147 ea., $260,925.

AiResearch-Arizona Ups Subcontracts

Use of subcontractors by AiResearch Mfg. Co. of Arizona has grown to the point where outside production facilities in Phoenix, most of them in the small business category, are providing up to 70% of the tooling and a large portion of the fabricated parts needed by the company to fulfill stepped-up defense contracts.

These outside contracting activities are expected to go higher later this year when AiResearch starts assembly of small gas turbine compressors and air turbine starters in its $5-million Phoenix plant. The firm now has contracts with 150 manufacturers, specialty and machine shops from Chicago to the Pacific Coast.

Vinyl Coat Seen Cutting Damages

Lockheed Aircraft Corp. has come up with two ways of reducing damage to aluminum sheet and precision parts.

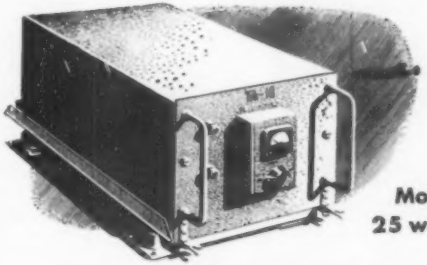
A strippable vinyl plastic protective coating and a moldable paper cover have been enlisted to cut these damage costs.

The tough plastic coat will be sprayed on all aluminum sheet of gages up to .091 in. as the material travels on a conveyor line. The protective coat will stay with the metal until the plane is completed and ready for its paint.

Lockheed sees an estimated 65% saving in scratch-damage charges—perhaps as much as $35,000 a month. The company reports that the material has greater durability than any other coating, has 50% greater elasticity, and is impervious to sunlight and moisture.

The waxed, moldable paper covers also will mean important, though lesser savings, Lockheed believes.

Leading Airlines Choose Bendix TA-18BB VHF Transmitter



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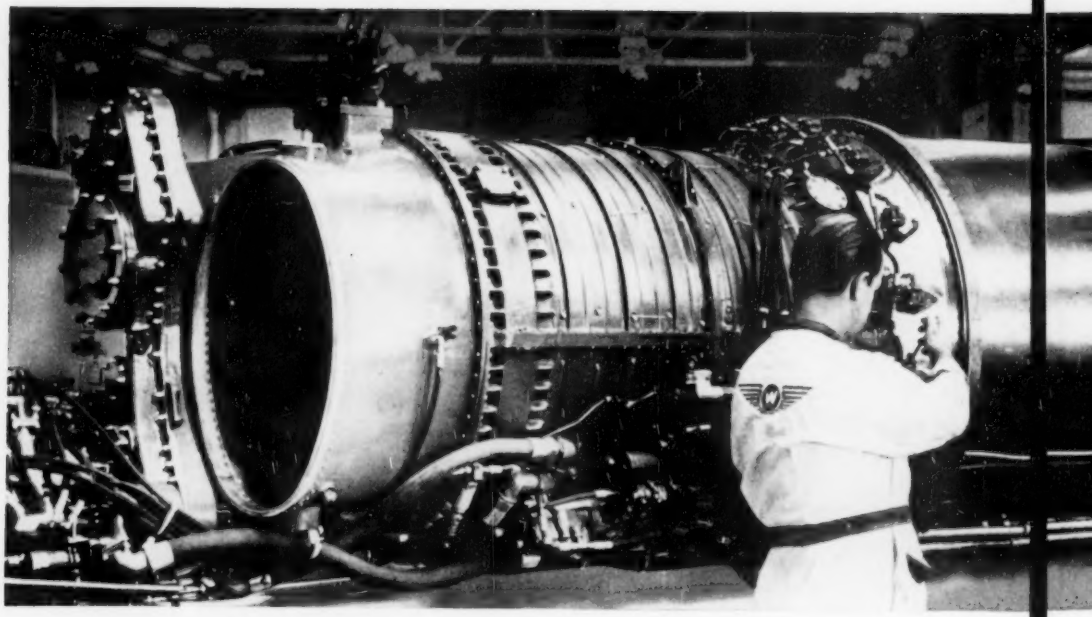
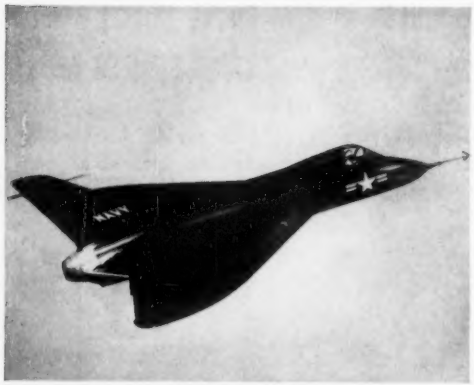
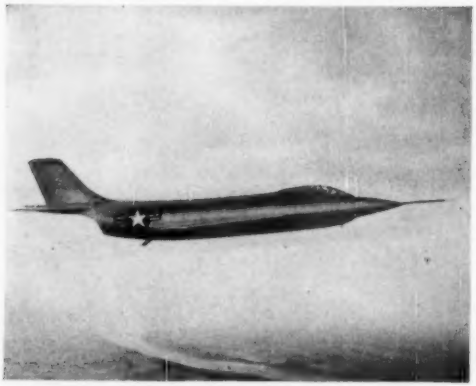


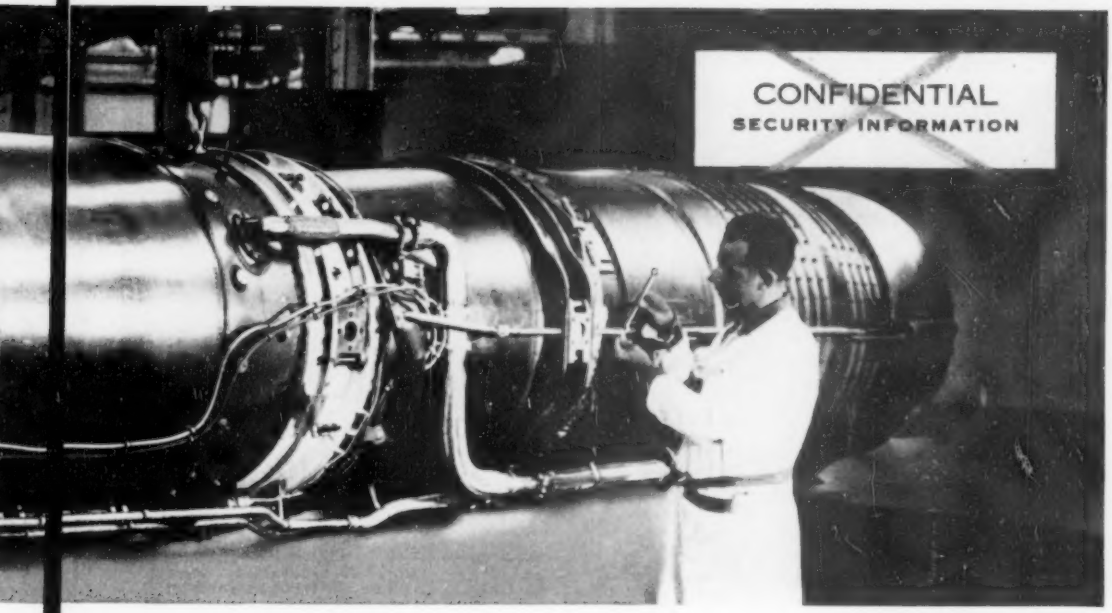
U. S. Navy and Westinghouse reveal



F4D "Skyray", built by Douglas, is being prototype-tested with an earlier model of the Westinghouse J40. Production versions will be powered by the new J40 or by later developments of this engine.



F3H "Demon" will soon be in quantity production. It was especially designed by McDonnell to fully utilize the tremendous thrust of this and the even more powerful Westinghouse J40 engines of the future.



world's most powerful jet engine

The United States Navy and the Westinghouse Electric Corporation have just qualified the world's most powerful turbojet aircraft engine . . . the J40. It develops more than 25,000 horsepower at flight speeds. The new engine has successfully completed the Defense Department's grueling 150-hour qualification test and is now approved for quantity production.

This single engine is two and a half times as powerful as the combined *four* engines of a B-29 Superfortress. Its weight, however, is only about 3500 pounds . . . less than that of *one* of the B-29's engines and propellers. The slim engine is twenty-five feet long and about forty inches in diameter. It produces more thrust per square foot of frontal area than any other turbojet. Like all Westinghouse engines, it is of the axial-flow or straight-through design.

As delivered to plane manufacturers, for production aircraft, it will be the first engine to provide constant speed drives for airplane accessories as an integral part of the engine . . . providing substantial savings in plane weight and space.

Two new Navy fighter planes will be powered by this new jet engine which was designed by Westinghouse in co-operation with the Navy Bureau of Aeronautics. These are the McDonnell F3H "Demon" and the Douglas F4D "Skyray". Even more powerful versions of the J40 are being developed for these and other aircraft.

Westinghouse, builder of the first American-designed jet engine, has been working with the military services on turbojet design and development since the day after Pearl Harbor. Behind the glamour of these jets is the intensive effort of hundreds of scientists and engineers. Progress in jet propulsion is not easily made. What seem like insurmountable obstacles sometimes arise. Like other companies, however, Westinghouse has encountered and successfully met such situations.

Westinghouse is investing millions of dollars and man-hours to help keep American jet-propulsion leadership. Jet engines are produced at the South Philadelphia and Kansas City plants of Westinghouse. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Penna.

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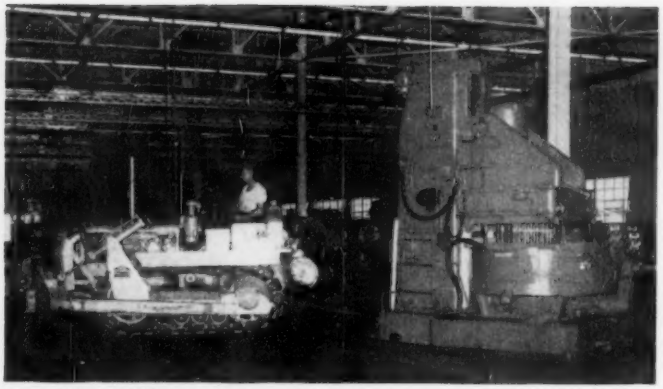

MULTIPLE SPINDLE drill press is tractor-hauled to new location in North Haven P&WA plant after quick trip from East Hartford.

P&WA's Move-and-Produce Plan

A new plant for production of piston-engine parts is getting the finishing touches by Pratt & Whitney Aircraft engineers. This latest move in P&WA expansion is at North Haven, Conn., and is a repeat pattern for the moving efficiency demonstrated previously in new plant setup at Southington, Conn. (AVIATION WEEK Feb. 19, 1951, p. 21).

▶ **Quick Timing**—North Haven is a simultaneous move-and-produce scheme. As soon as Service does its readying job, production machinery is cut from established lines in P&WA's East Hartford facility; a few hours later they are spotted in the North Haven factory, with millwrights, electricians and plumbers supplying the finishing installation touches.

Where the machine is in the middle of an engine-part job at East Hartford, the work is moved right along with the machine and finished in the new location.

▶ **Plant Data**—While the North Haven plant output primarily will be confined to P&WA's piston engines, turbojet production here is still a possibility. Even now, one area of the shop has been set aside as a sheet metal facility where parts for experimental jets will be frabricated.

Plant area encompasses 700,000 sq. ft., with 500,000 sq. ft. for production. The setup will accommodate 18 departments.

Machine tools involved in setting up the new plant total 1,328. First production machine was installed June 2, and first work was cut in the new plant the same day. Crankshaft department, final one scheduled for the move, is timed to begin operation in October. Up to 4,000 employes are being transferred or hired and trained. Leete P. Doty, who previously headed the Southington operation, is plant superintendent at North Haven.

▶ **Timetable**—Here are some of the close-timings the move to North Haven involved:

• **Completion of maintenance** and area preparation to receive machinery.

• **Drawing department layout** detail plans—exact spotting of all machines, desks, tables, benches and miscellaneous equipment.

• **Marking plant floor** to correspond with layout blueprints.

• **Transportation of machinery**, equipment, raw material and semi-finished parts.

• **Spotting machinery** and equipment so that subsequent installations won't be hindered.

• **Machinery installation** and first runs made for checking.

• **Commencement of manufacturing operations.**

Purpose of this closely controlled move plan stresses one prime objective—that the move won't materially slow production in the department shifted to the new plant.

Frauenthal Merges

Kaydon Engineering Corp., Muskegon, Mich., has bought A. Frauenthal, Inc., makers of large multiple-head precision cylindrical grinders and boring and turning machines. The Frauenthal company was the initial venture of Kaydon's founder, A. Harold Frauenthal. It is expected that management, engineering and production facilities will be integrated to boost efficiency under the merger. Total employment of the two enterprises is slightly less than 500. Recently Frauenthal brought out a new small grinder with table sizes from 30-48-in. diameters.

Fairchild Flying Boxcar Uses 32 Thermoswitch Units

IN THIS C-119 FAIRCHILD "FLYING BOXCAR," hot air heats the crews' quarters and provides anti-icing protection for wing and tail surfaces. Eight unit heaters produce the hot air which must be maintained at a constant temperature. That job is effectively handled by 32 Fenwal THERMOSWITCH® controls . . . four to each heater.

CHOSEN AFTER TESTS of a series of controls, Fenwal THERMOSWITCH units have been used in Flying Boxcars for nearly three years. Fairchild praises their reliable performance, simple design and low cost. These Fenwal temperature control devices are especially developed for applications subject to severe environmental and operational conditions.

QUANTITY PRODUCTION of Fenwal Aircraft Heater Controls (as shown in this picture) is accomplished by well-trained assemblers who make up this assembly line. Their skill is backed up by rigid quality control methods which include X-ray inspection. Adequate and efficient production facilities keep all Fenwal THERMOSWITCH units moving in increasing quantities.

CUTAWAY VIEW of Fenwal THERMOSWITCH control shows enclosed electrical contacts. The temperature-sensitive shell expands or contracts *instantly* with temperature changes, thus making or breaking the contacts. Fenwal units are compact, highly resistant to shock, vibration and extreme temperature conditions. For complete data on these and other Fenwal aircraft controls, write FENWAL, INCORPORATED, 129 Pleasant Street, Ashland, Mass.

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What every pilot should know about MICRONS

(Psst! What you don't know can hurt you!)

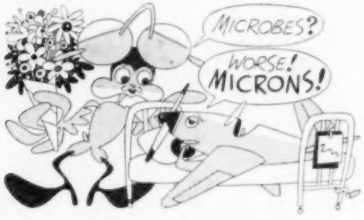
"And what," you ask, "is a *micron*?"

Answer: "Micron" has *two* definitions, and you'll want to know them both—the first to impress your friends, the second to keep out of trouble. Here they are:

1—A micron is a *measurement of length*. Just remember that 25,400 microns equal one inch . . . and then take it from there. From now on, in your hangar-flying sessions, don't just say "mile" when you can say "1,609,344,000 microns." The boys will be amazed.

2—A micron, chemically speaking, is a particle having a diameter of .000039 inch. Engine manufacturers warn that particles larger than 10 microns in diameter can be injurious to your engine. Four particles of this 10-micron size would have to get together before you could even see them with your naked eye, even if your latest CAA physical shows that you have 20-20 vision.

But when these invisible particles get into your engine—watch out! They can cause damage or undue wear. They could even cause engine failure and a forced landing.



How do they get in?

They get into your engine with the gasoline—regardless of the brand you use. No matter how carefully it's transported from refinery to airport, gasoline can't help picking up airborne dust particles, including sand and rust.

How to trap the little rascals

How can you trap these particles—keep them out of your engine? Not with fine mesh screens. And certainly not with ordinary filters. The *only* solution is to force the gasoline through specially designed filters—just ahead of the gasoline hose—before it goes into your tank.

So that's exactly what Gulf is doing for you. Gulf has installed filters on its Aviation Gasoline dispensing equipment, designed to completely remove all particles 10 microns in size or larger. From now on, for the sake of your engine and your own safety, go GULF . . . get gasoline that's *refinery clean*.

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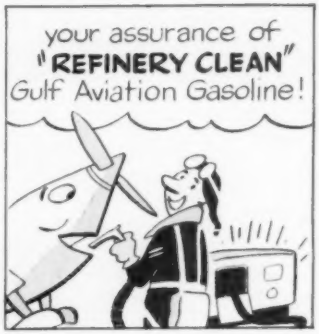


New Ignition Better, Yet Cheaper

Scintilla TLN-10 for jets is not only more effective, but is lighter and simpler than its forerunners.

By Philip Klass

Bendix's Scintilla Magneto division has reversed the familiar aviation trend of obtaining improved performance at the expense of weight, complexity and cost. Its newly announced model TLN-10 jet engine ignition weighs only 7 lb., but gives surer engine starts than former units under adverse conditions, including fouled or fuel-wetted plugs.

Here's a comparison which shows how favorably the new ignition stacks up against the previous model TEN ignition Scintilla produced for the Allison J33 turbojet used on F-80s and early F9Fs.

- **Lighter weight:** 7 lb. vs. 35 lb.
- **Hotter spark:** 10,000 w. vs. 3,000 w.
- **Lower voltage:** 1,000 v. vs. 15,000 v.
- **Foul proof:** Capable of firing plug with 10-ohm leakage path vs. 5,000-ohm minimum for the TEN ignition.
- **Lower cost:** Roughly $350 vs. $1,000.

▶**It Looked Easy**—At first, turbojet ignition design looked like a snap compared with ignition design problems associated with piston engines:

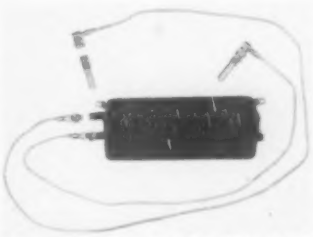
- **Critical timing of spark** to cylinder position was eliminated.
- **Jet ignition operated** only intermittently; once the jet burners were ignited, the engine became self-supporting except in the event of flame out.

But it didn't take the military services and ignition designers long to realize that jets had their own peculiar, and extremely difficulty, ignition problems.

▶**Jet Ignition Problems**—Unlike the piston engine where ideal fuel-to-air ratios exist under stable conditions, the jet ignition designer found himself trying to ignite a very cold and over-lean fuel-air mixture rushing past the igniter plug at speeds of 300 ft./sec. and higher.

A delay in engine "light off" permitted unburned fuel to accumulate. When finally ignited, this excess fuel gave a "hot start" which often damaged turbine blades.

Or, if too much fuel had entered the burner, it had to be cleared before a new start could be attempted. (This latter problem has been at least partially solved now by automatic engine controls going into use on newer aircraft.) Furthermore, fuel and moisture wetted the plugs, or carbon accumulated in the plugs, providing a low-resistance (leakage) path for ignition energy.



Low cost, light weight Scintilla TLN jet ignition provides hotter spark.

▶**New Approach**—Using an adaptation of piston-engine ignition techniques to meet its then current needs, Scintilla set out to find a brand new approach to the special jet ignition problems. The search was handicapped by the fact that the electric spark ignition process is not too well understood from a theoretical standpoint; there are at least two conflicting theories.

However, Scintilla established two criteria for satisfactory spark ignition which were compatible with either theory. These were:

- Fuel-air mixture must be raised to some critical temperature.
- Ignition, when it occurs, takes place in less than 5 microseconds after the spark reaches its maximum power level.

Scintilla also concluded that the amount of energy (quantity of heat) in the spark is less important to successful ignition than spark duration time. The weight of that portion of the fuel-air mixture which needs to be ignited is actually very small, as is the specific heat of the mixture.

Scintilla's flight tests confirmed that only a small fraction of one Btu. is needed.

▶**Time and Temperature** — Scintilla based its new ignition development on the philosophy that other factors being equal, the temperature of an igniter plug depends upon the energy in the spark, and its duration. The shorter the spark duration, the higher the spark temperature. Expressed another way, spark temperature depends upon the power (watts) expended in the spark.

One way to increase spark temperature is to increase the current flowing through the spark. However, because the resistance of the spark goes down as the current goes up, only 10 to 20% of the total ignition system energy will appear across the spark. Hence sizeable increases in ignition energy are required to obtain small increases in spark energy. Furthermore, higher energy levels increase the erosion rate of the igniter plug electrodes.

A much more attractive method of raising spark temperature is to reduce spark duration. (Since ignition takes place in less than 5 microseconds, a spark of any longer duration serves no useful purpose.)

For example, a spark which dissipates 0.4 joules of energy in 4,000 microseconds will have a power level of 100 watts; if the interval can be cut to 40 microseconds, the wattage will be upped to 10,000, and spark temperature will be 100 times higher for the same spark energy.

▶**Practical Limits**—Practical circuit considerations limit the brevity of spark duration which can be obtained. Any circuit inductance caused by wiring or transformers between the energy source and the igniter plug will reduce the rate at which energy can flow into the spark and hence spark duration.

Scintilla first applied this new design philosophy to its model TEN ignition which used a condenser to store igniter energy, and electronic tubes to control the flow of energy to the igniter plug. By eliminating stepup transformers in the discharge circuit, system inductance was reduced sufficiently to permit discharge in a few hundred microseconds. This enabled Scintilla to achieve a 1,500% increase in spark power over its previous ignition, with only a 200% increase in spark energy.

▶**Further Reduction**—In its newest TLN-10 ignition, Scintilla has cut discharge time further, to about 25 to 50 microseconds, according to S. E. Gregoire, assistant chief engineer. It has also eliminated the vacuum tubes and

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Small 1½ in. panel meters are now available with built-in illumination provided by either a 6-, 14-, or 28-volt lamp. Instruments use D'Arsonval movements and come in variety of types, some with watertight seals. International Instruments, Inc., P. O. Box 2954, New Haven 15, Conn.

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increased spark power by more than 300% over the TEN model with only a 30% increase in spark energy. The TLN-10 produces 10,000 w. across the spark with an energy content of only 0.4 joule.

▶**Establishing the Spark**—Once the igniter spark is established, the voltage drop across the plug is relatively low—usually under 100 v. High voltage is normally required only to ionize the gap and start the spark; after this happens, a relatively low voltage can sustain the spark.

In its previous model TEN and TCN ignitions, Scintilla provided a high-frequency, high-voltage, low-energy spark to establish the spark. It required 15,000 v. applied for about 5 microseconds to insure plug ionization when the igniter was badly fouled with carbon. Once the spark was established, a low-voltage, high-temperature spark was automatically initiated which served to ignite the fuel-air mixture. Total duration of the two sparks was about 100 microseconds.

▶**Eliminating High Voltage**—The use of high voltage, particularly at higher altitudes, presents many insulation problems such as corona, flashover, and dielectric losses. These high tension problems prompted Scintilla to pour considerable effort into finding a way to eliminate the high voltage which is required for the initial ionization step.

The result of this effort is an igniter plug which requires a potential of only a few hundred volts to ionize instantly the gap between the center electrode and the shell. The secret is a substance built into the nose of the igniter plug. Otherwise the plug closely resembles a conventional unit in appearance, size and weight.

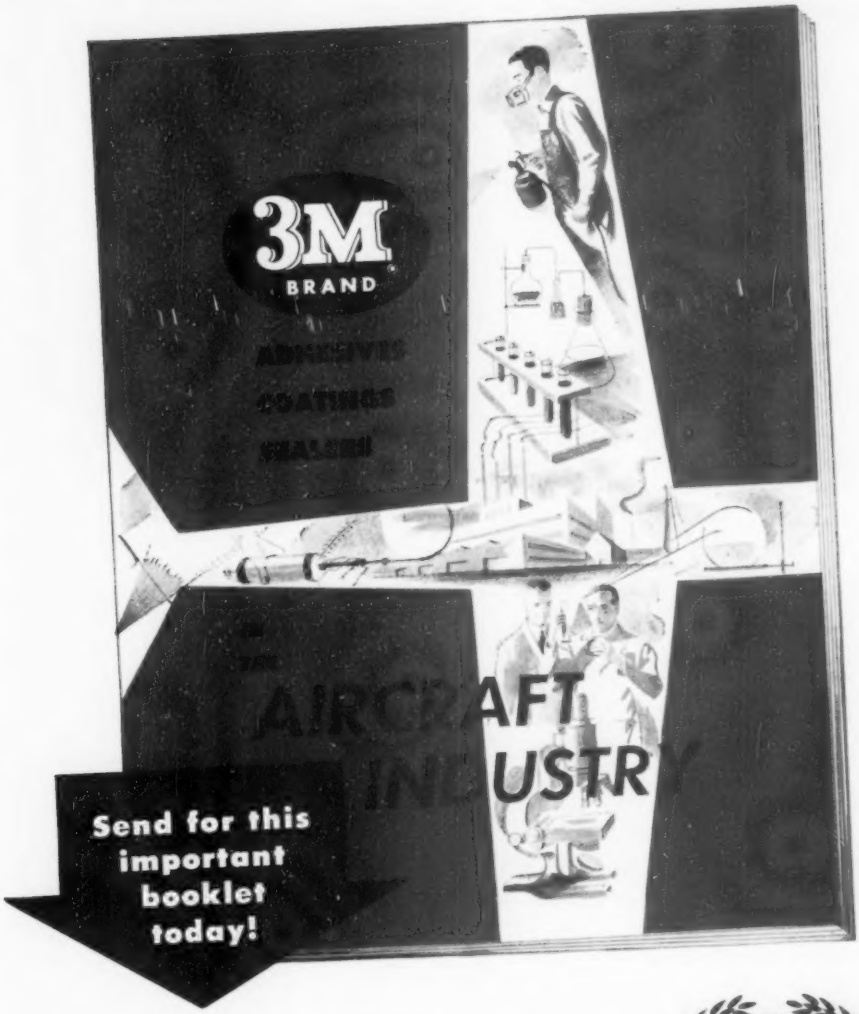
Used in the TLN-10 ignition, the new plug allows ignition voltage to be dropped from 15,000 v. to 1,000 v.

▶**Advantages**—The low-tension ignition enables Scintilla to use cable insulation which has poorer dielectric strength but better heat resistant properties. This in turn permits the ignition box to be engine-mounted in a variety of locations. The new cables can withstand temperatures up to the melting point of copper, Scintilla says.

The new plug design also assures that the spark will take place within the annular space between the center electrode and the shell. The spark won't wander away from the plug nose in the form of long thin ineffective streamers when subjected to ram air pressures.

▶**Solves Fouling Problem**—When carbon deposits build up within an igniter plug, they provide a low-resistance path around the gap which makes it difficult, if not impossible, to establish the spark. When the igniter plug becomes badly

working on Aircraft Contracts?



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wetted by fuel, a similar situation exists.

To illustrate the improvement in firing fouled plugs, Scintilla says that its earliest jet ignitions could tolerate a shunt resistance of no lower than 300,000 ohms from fuel wetting or carbon fouling. The TEN and TCN types could tolerate a minimum of 5,000 ohms; the new TLN-10 will fire when the shunt resistance is as low as 10 ohms, Scintilla says.

▶ **How It Operates**—To provide backup protection, jet engine ignitions actually contain two dual and completely independent systems. The extreme simplicity of the new TLN-10 can be seen by examining one of the two identical channels. The energy reservoir is a large tank condenser. It is charged from the secondary winding of a transformer whose primary is excited from the ship's supply through a breaker.

The ignition breaker is opened and closed many times each second by a continuously rotating d.c. motor driving a cam. Each time the breaker is opened or closed, the surge or decay of current in the primary winding creates a voltage on the secondary which adds to the energy (charge) in the tank condenser.

The same d.c. motor also serves to operate the contactor which connects the tank condenser to the igniter plug to permit it to discharge through the plug. The contactor closes 5 or 13 times a second (approximately), depending upon the ship's supply voltage (14 or 28 v.). The breaker opens and closes several times for each movement of the contactor to build up the energy in the tank condenser.

A rectifier between the transformer and tank condenser prevents the condenser from discharging back through the transformer. A small condenser across the breaker contacts is used to prevent serious arcing of the breaker surfaces. The dual channels are independent except for the d.c. motor operating the contactor and breaker.

▶ **The Future**—The principles of TLN type of low-tension ignition may find application on reciprocating engines, Scintilla thinks. Its decreased spark plug erosion, freedom from fouled plugs, and elimination of high-voltage problems would make it attractive.

It would also enable jet ignition developments to help repay some of their debt to piston-engine experience.

New Reactor Catalog

Southwestern Industrial Electronics Co. has prepared a complete catalog describing its low-frequency transformers and reactors including a new miniature line. SIE says its transformers and chokes have unusually high inductance giving excellent low-frequency performance. (2831 Post Oak Road, Houston, Tex.)

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Kansas City, Kan. & Linden, N. J.

New Oscillograph Withstands Shock

A small 8¼-lb. oscillograph with 12 recording channels has been introduced by Midwestern Geophysical Laboratory. The manufacturer says tests at the U. S. Naval Ordnance Lab. showed their new Model 560 capable of operating under extremely high shock conditions (100 to 500 Gs).

The oscillograph records on 3½-in.-wide film and holds a 40-ft. supply. Three film speeds are available by changing gears and all operating controls and the viewing screen are accessible from one end, the manufacturer says. A variety of galvanometers with undamped natural frequencies as high as 3,500 cps. are available for use with the new oscillograph.

Midwestern Geophysical Laboratory, Tulsa, Okla.

FILTER CENTER

►**CF-100 To Get M-H Stabilizer**—Canada's CF-100 jet fighter, built by A. V. Roe, will be equipped with a new Minneapolis-Honeywell yaw stabilizer (damper) to eliminate Dutch Roll characteristic common in high speed jets. M-H says the stabilizer, called a yaw axis control, will be much advanced over previous dampers and can be expanded into a complete autopilot at a later date if desired. Contract amounts to about $1.7 million.

►**New Mag-Amp Regulator**—Westinghouse is expected to announce a new all-magnetic amplifier aircraft voltage regulator soon. It will use no vacuum tubes, in contrast to recently-announced GE mag-amp regulator which requires a cold cathode tube to establish a reference voltage. (AVIATION WEEK Aug. 11, 1952, p. 36.)

►**Speed Up F-94C Autopilot Tests**—USAF will allocate a Lockheed F-94C to be used solely for flight testing the plane's new Westinghouse W-3A autopilot. Westinghouse had been unable to get sufficient flight time to iron out autopilot stability problems on previous test plane because of higher priority given to other airplane problems.

►**Collins Tests Approach Horizon**—Analysis of flight records showing localizer performance of Collins Radio's approach horizon flight director during 100 under-the-hood ILS approaches at 10 different airports shows that 80% ended up within ± 25 ft. of runway centerline; 94% were within ± 50 ft., Collins says. Flight records are now being analyzed to establish glide-slope performance.

►**New D-C Power Supply**—Bristol Engineering Corp. has announced its "400 series" of regulated d-c power supplies for lab use. Two standard units which hold output voltage constant within ¼% from zero to full load are available for immediate delivery. Each provides 200ma. of regulated power; another 200ma. of unregulated power, plus 6 amps of 6.3 v.a.c. for filament supply. The Model 401's regulated voltage is adjustable between 250 and 500v.; its unregulated voltage supply is 650v. The Model 402's regulated voltage can be adjusted between 150 and 325v.; unregulated voltage supply is 450v. (Bristol Engr. Co.; Lincoln Ave. & Pond St.; Bristol, Pa.)

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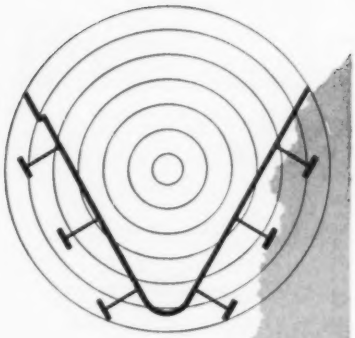

The 13,200-ton squeeze of this press means that Alcoa extrusions can be larger, thinner, and more intricate than before. Ribbed extrusions for panels, for example, can be made, as illustrated, 34 inches wide—saving greatly in riveting and assembly.

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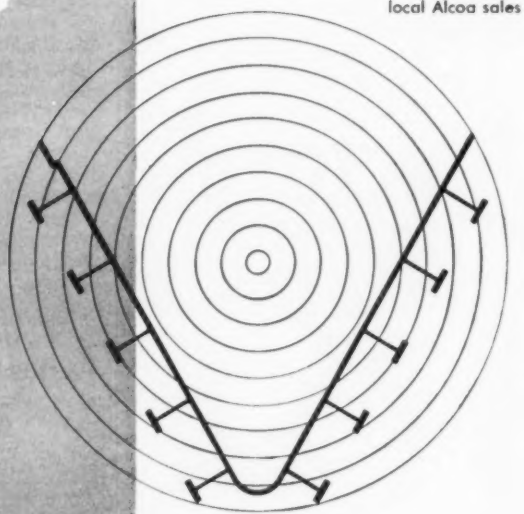

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TPA Aloha: The Fly-by-Day Airline

- **Five-DC-3 inter-Island carrier plans growth.**
- **Upping flight frequencies is a main concern.**

By George L. Christian

Honolulu, T. H.—The business of operating an airline is interestingly flexible.

Take TPA Aloha Airlines. The operating section of the airline shuts down every evening at 7:10, after 38 flights. It becomes airborne again at 6 am.

On the other hand, the carrier's shops at Honolulu Airport are devoid of mechanics during daylight hours—tool boxes locked and stacked, hangar empty.

At sundown, Aloha's maintenance personnel come on the job to keep the carrier's fleet of five DC-3s in tiptop mechanical condition. They go home at dawn.

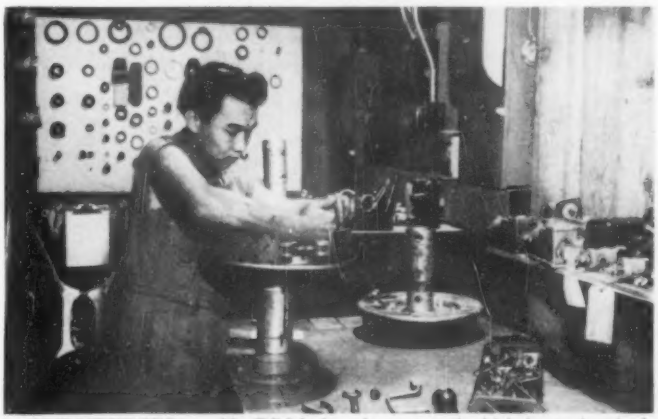
And another of Aloha's departments, Passenger Service, has some interesting ideas—particularly, how to cure one of the biggest headaches in airline business, no-shows: Simply sell the passenger a cash register receipt instead of a ticket to a specific destination. No seats reserved; first come, first served.

▶**Only One Feathered**—Aloha officials believe they have set something of a record by flying 4,160,000 mi. in 5½ years before having a featherable failure on its Pratt & Whitney R1830-92 engines. The figure is particularly interesting because the carrier's hops are relatively short (100 mi. or less) and therefore frequent engine-consuming takeoffs are standard operating procedure. The airline attributes part of this record to its strict 25-hr. inspection procedure which includes pulling oil screens and fuel strainers. Engines are overhauled at 1,200 hr. by Southwest Airways in San Francisco.

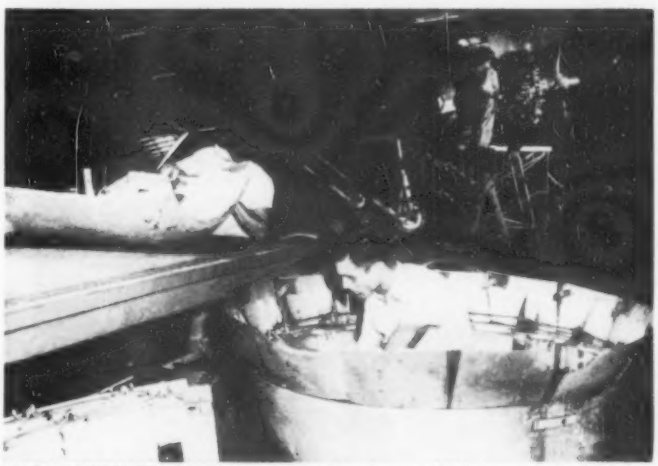
Major engine problem cited was sticky valves. Trouble usually begins at half engine life. Cure, so far, is to ream guides. TPA also is experiencing cam follower wear which it is combatting by chrome plating the part and making frequent inspections.

Spark plugs (Champion R37S-1) go a full 300 hr. at Aloha. The carrier has plans to take a 300-hr. set, check the gap and run them another 100 hr. If they are in good shape (and TPA maintenance personnel think they will

TPA TERMINAL, Puunene, Maui, typifies unpretentious but bustling carrier's facilities.



NATIVE MECHANIC assembles DC-3 brake, a frequent overhaul job due to short hauls.



MAIN OVERHAUL BASE is at Honolulu, where a DC-3 is undergoing checkup.

be), an extension to 400 hr. will be asked.

▶ **Around the Shop**—A tour through the Aloha hangar and shop facilities brought out these observations by the carrier's maintenance personnel:

• **Corrosion** is a big problem, especially on the under surfaces of wings and stabilizers because of the ever-present salt-laden air. Turco Products' 3002 brightening agent has proved effective as a polish and corrosion inhibitor.

• **Fuel** drain lines have been changed from solid to Aeroquip flexible hose. Much cracking, breaking and resultant leakage has been eliminated.

• **Utilization** is hitting the 6 hr.-a-day mark—not bad when you consider that the airline only operates during daylight hours.

• **Generator** overhaul period has been cut to 600 hr., exactly half the engine removal time. Result has been a 60% reduction in generator overhaul costs because units are pulled before brushes wear out, bearings fail or quill shafts break, causing an unscheduled removal and usually expensive overhaul job.

• **Interior** of Aloha's DC-3 fleet is being remodelled on an Hawaiian theme. Side panels are of plaited, fireproofed lauhala; side walls are decked with grass cloth and headliner is soft grey cloth. Green leatherette covers the seats. Window curtains display an Island flower print. Individual ventilators add air to that circulated by existing floor vents.

• **Brake** cylinder leakage is a problem, aggravated by frequent landings and takeoffs. Brakes are inspected every 200 hr., average shoe life is 500 hr.

• **Aloha** performs all its own maintenance except for powerplants (including carburetors and propellers).

• **Frills** are kept to a minimum. Passengers get magazines to read and water to drink, the latter sometimes supplemented by pineapple juice.

▶ **Double the Load**—Ruddy F. Tongg, TPA's president, cited the fact that April, 1952, was the first month in which TPA had succeeded in doubling its passenger load over the same month a year ago. He indicated that if the first few months were accurate prognosticators of the entire year 1952, his airline would show a $125,000 profit as opposed to a $200,000 deficit in 1949 when the carrier started scheduled operation.

The initials TPA, he said, stand not only for "Trans-Pacific Airlines," but also "The People's Airline." He explained that the carrier's stock was reissued at $1.00 par value to put it within everybody's reach. Tongg said he wants to spread ownership to every corner of the territory so that every time a TPA plane drones overhead, the people will say, "I've got a piece of that plane."

▶ **Operations Picture**—The Hawaiian Islands present many tempting pictures to airline operators. The two most enviable: almost no weather problems—weather is good almost 100% of the time; and practically no surface transportation competition. For all practical purposes, airplanes provide the only means of traveling between the six principle Hawaiian Islands of Kauai, Oahu (Honolulu), Molokai, Lanai, Maui and Hawaii.

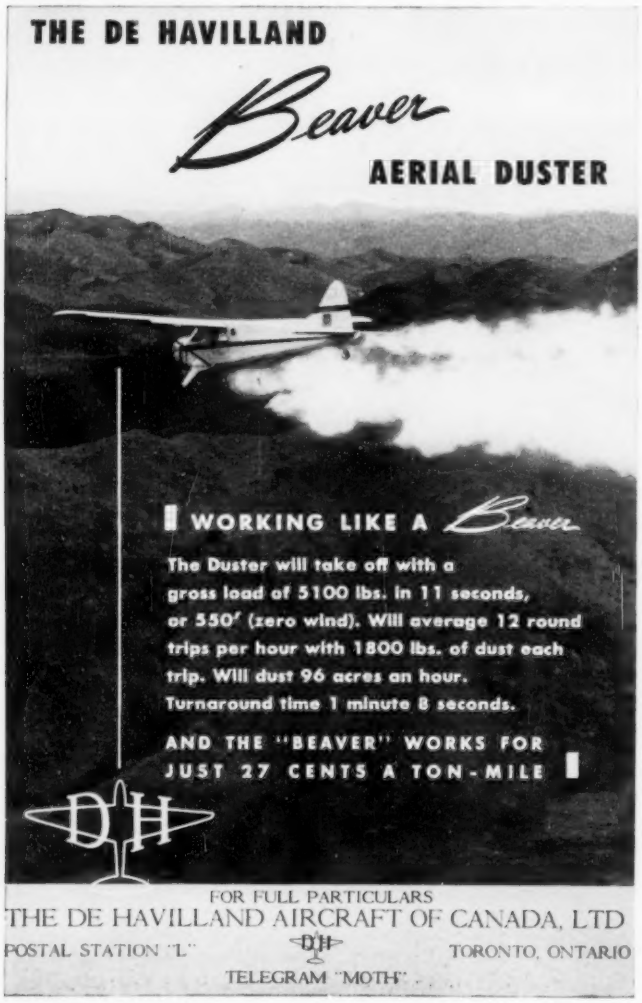
David Benz, TPA's executive vice president, stressed this fact: what air traffic in Hawaii needs is more flights with aircraft equipped to handle 20-25 passengers. Current traffic does not require large planes whose flights have to be spaced to insure adequate payloads at relatively high cost.

Benz added that his company's 28-seat DC-3s provide enough capacity for 90-95% of TPA's flights which are almost 100% parallel to its competitor, Hawaiian Air lines.

To sum up, Benz said TPA is concerned with two things:

• **High flight frequency**—ultimately at 30 min. intervals.

• **Low operating** cost to combat rising prices. He cited these increases in costs in less than three years: fuel, up 10%; labor, 23%; taxes, 57%; parts, 100%. (However, operating costs in terms of aircraft revenue miles are down 10%.)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GENERAL ELECTRIC

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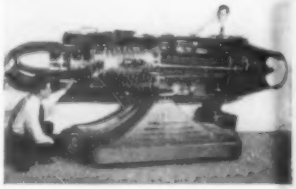
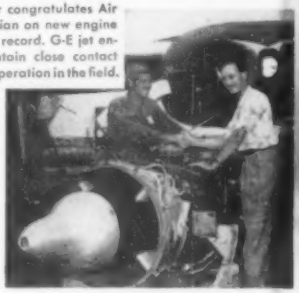
Boeing B-47, shown in rocket-assisted take-off. Powered by six G-E engines, the B-47 is the fastest known bomber in the world.

Cutaway of G-E's J47, America's number one production jet. Among the planes powered by this engine is the famed North American F86 Sabre.



G-E engineer congratulates Air Force technician on new engine performance record. G-E jet engineers maintain close contact with engine operation in the field.

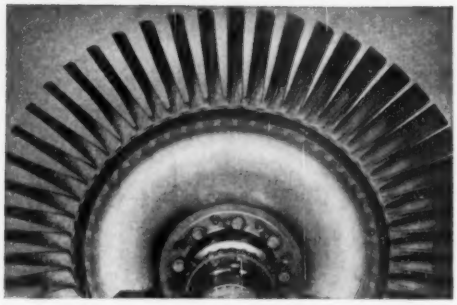


G-E engineers examine model of new turbojet. Group conferences such as this are standard procedure in the development of G-E jets.

This modern engineering and administration building is the hub of all activities at G-E's jet center.

The NIMONICS

high-temperature alloys that offer many useful properties.



HERE IS HOW the Nimonic "80"A blading of a J-42 turbine looks after 500 hours of test running. The blades, according to Pratt & Whitney, are in almost as good condition as they were at the start of the test.

As time passes, you'll hear the Nimonics talked about with increasing frequency.

And with good reason! The Nimonic alloys (we'll discuss two of them individually in a moment) are high-temperature alloys. Their characteristics are frequently sought by aircraft designers.

Let's consider Nimonic "75" (available in sheet only) first. Offering high resistance to oxidation and corrosion, it is particularly useful wherever a limited creep deformation can be tolerated under steady load and at high operating temperatures.

Up to now, Nimonic "75" has been used mainly for nozzle guide vanes, flame tubes and other combustion chamber components in British and American aircraft turbines. But its field, of course, is not strictly limited to these applications. Wherever inlet temperatures push above 1450° F., Nimonic "75" may well be kept in mind. It provides:

- High creep and fatigue strength
- High oxidation resistance at elevated temperatures
- A low coefficient of expansion, similar to mild steel (holds distortion to a relatively low level)

The second of these high-temperature alloys (available in bar stock only) is Nimonic "80"A. This is the standard material used for moving blades in nearly every production aircraft turbine in Great Britain. It is the material used, too, for turbine blades of Pratt & Whitney J-42 Turbo-Wasps, the jets that have flown more than 150,000 hours *without a single turbine blade failure.* The picture above shows the excellent condition of these blades after a 500-hour test run.

Essentially a forging alloy, Nimonic "80"A compares favorably with other alloys designed for long periods of high-temperature service under stress. While its superior creep resistance is largly responsible for its suitability as a blade material, its high oxidation resistance at elevated temperatures and its high fatigue strength under stress are also important.

Both of these Nimonic alloys have working qualities that greatly increase their range of usefulness to the designer. They can be machined by commonly-used methods, and with standard equipment. Their toughness and capacity for work-hardening, however, call for careful tool placement, fairly slow cutting speeds and generous use of lubricant.

Welding is readily accomplished by any of these methods: oxy-acetylene, inert gas arc, metallic arc, flash, spot, stitch, seam or butt. Detailed information on procedures is available, and Inco's Technical Service Section will be glad to furnish it upon request.

In fact, when you need help with any metal problem involving high temperatures, call on Technical Service. There's no charge, no obligation.

One more point, and we'll be through. The Nimonics – like other Nickel Alloys – are on extended delivery because of defense needs. So it is important to include NPA rating and complete end-use information with all orders.

Approximate Composition

	NIMONIC "75"			NIMONIC "80" A		
Carbon	0.08	—	0.15%*	0.10	max.	
Manganese	max.		1.00	1.00	max.	
Sulfur	max.		0.015*	0.015	max.	
Silicon	0.30	—	0.80	1.00	max.	
Chromium	19.00	—	21.00	19.00	—	22.00
Titanium	0.25	—	0.50	2.00	—	2.75
Iron	max.		2.00	2.00	max.	
Copper	max.		0.50	0.50	max.	
Aluminum	max.		0.40	0.90	—	1.50
Nickel	Remainder			Remainder		

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So far, the DC-3 is the best, most reliable aircraft for Hawaiian operation, he concluded. Aloha will keep its eyes open for a more suitable, more modern plane, but none is available now, it feels.

▶ **No No-shows?**—O. McCraw, Aloha's Passenger Service Manager, told AVIATION WEEK about his plan to eliminate one of the principal and most aggravating drains on airline revenue—the no-show.

The TPA plan calls for use of a cash register which doles out a cash receipt to the customer for so many dollars and cents—that is all. No origin or destination is shown on the receipt. And no reservation is made. The passenger simply goes to the airport, purchases his receipt, climbs aboard the airplane. McCraw admitted that oversales inevitably would occur occasionally. But these would be taken care of in two ways.

• **Shunted** to next flight. This would be quite feasible with the high frequency flights stressed by Benz. McCraw believes the average passenger would not resent too much taking a half hour delay on his departure.

• **Extra section.** This is a particularly practical method to use during anticipated periods of heavy travel—over holidays, for example. Such a scheme would not be practical if an airline operated with consistent capacity or near-capacity loads. But with TPA's average of 60-65% load factors, McCraw feels the plan would be perfectly workable.

Advantages of eliminating the cost and sometimes confusion of reservations, to say nothing of the time-consuming process of ticketing, are obvious. Other benefits cited are that the machine automatically would make up totals in a matter of minutes, would differentiate between fare, tax, have symbols for revenue from passengers, excess baggage, freight or express.

The "cash register system" is not necessarily one that could be applied to any airline under any circumstances, but McCraw thinks it is just the thing for TPA.

▶ **International Flavor**—Ruddy Tongg's airline is spiced with considerable international flavor. Its executive roster carries a mixture of occidental and oriental names, such as Allan Barrie and Sai Chow Doo, Bill Randall and Hung Wai Ching, Allan Olson and Y. Baron Goto.

Tongg started life as a farmer's son, worked his way through the University of Hawaii and soon was engaged in such diverse activities as publishing books, operating a bottling company and handling real estate.

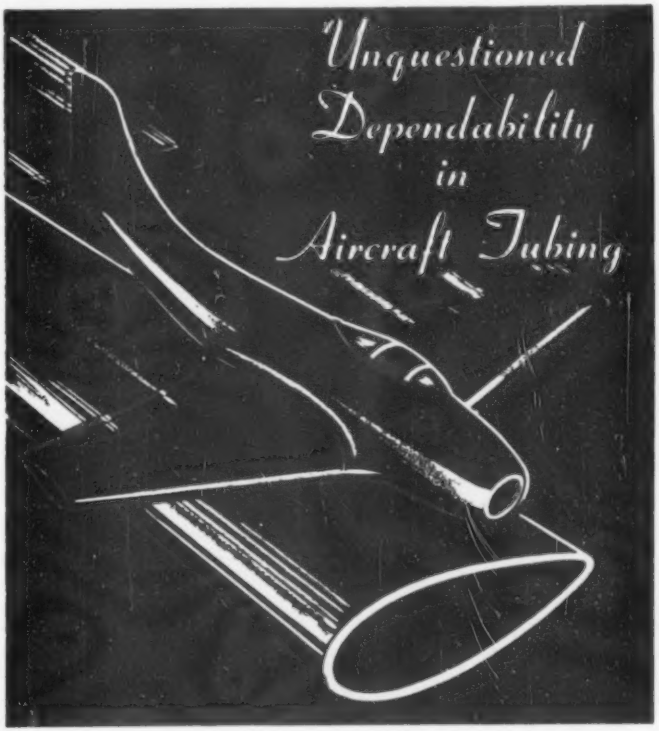
Among its pilots, directed by veteran chief pilot Olson, Aloha numbers men of Korean, Chinese, Japanese and Caucasian descent. To their credit is an unblemished safety record since the inception of operations on a charter basis in 1946.

Captain Olson has been flying some 25 years and has accumulated a total of 18,400 hr. in more than 20 types.

▶ **Air Minded Islanders**—Last year, about

AIRFREIGHT ECONOMIZER

Recent shipment of 67 aircraft turrets similar to the one shown above, flown by Slick Airways from St. Louis to Burbank, saved the shipper $30,000 over ground shipment. It figured out this way: Cost of packaging was $8,468 for air shipment, $37,528 for surface movement; airfreight charges were $5,583, surface shipping cost $6,523. Comparison was possible since identical quantity of the turrets had previously been freighted by surface transport.



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assures pilot vision
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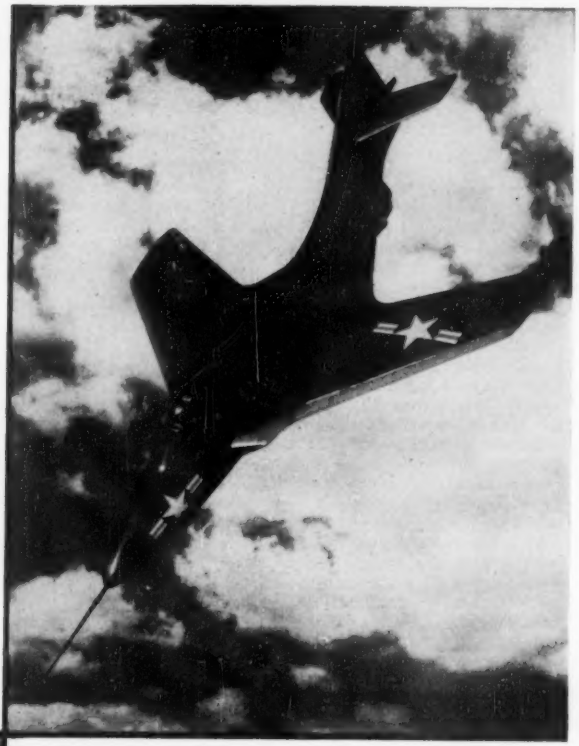

LATEST MEMBER of a long line of Navy fighters produced by Grumman Aircraft Engineering Corporation, Bethpage, Long Island, N. Y., is the F9F-6 "Cougar." It combines "over 600 mph" performance with low landing and take-off speeds that make it ideal for carrier and front-line operations. Its windshield is bullet-resisting, gunsight reflector-type Pittsburgh Multiplate Safety Glass.

Pittsburgh Multiplate Safety Glass

• The faster, better-performing planes that are taking their places as part of America's air arm today have characteristics that differ as widely as the tasks for which they were designed. But most of them have one thing in common. Almost without exception, they are equipped with Safety Glass by Pittsburgh.

The new Grumman F9F-6—a plane which began rolling off the production line less than five months after the first flight of the prototype—uses a windshield of Pittsburgh Multiplate Safety Glass. This bullet-resisting, gunsight reflector-type glass, reground and repolished to provide maximum optical properties, is almost standard equipment for windshields of fighter planes.

Aircraft manufacturers turn to Pittsburgh Safety Glass so frequently, because they know Pittsburgh offers the widest selection of special-purpose Safety Glass, backed up by competent technical assistance in selection of glass and glazing techniques.

Whenever you have a new design on the drawing board, that's the time to call in a Pittsburgh Plate Glass Company technical representative. He'll work with you in selection and application of the special-purpose Pittsburgh Safety Glass that fits the design and performance characteristics of the plane. Pittsburgh Plate Glass Company, Room 2120, 632 Duquesne Way, Pittsburgh 22, Pennsylvania.

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a half million people flew in the Hawaiian Islands—that adds up to an average of one flight for every man, woman and child in the Islands. And TPA carried 138,549 of those travelers, an increase of 54,670 over 1950, or a 47% boost in one year.

A quick trip in one of TPA's newly-decorated DC-3s from Honolulu to Lihue (on the northernmost island of Kauai) and return gave an index to the simple, on-time operation the airline offers. Passengers were farmers, housewives on shopping trips, sightseeing couples, children and old women.

Turnaround time at Lihue, which means a complete unloading and reloading of passengers, mail and cargo, was a quick five minutes.

TPA Aloha Airlines had a pretty rugged beginning. Its conception was naturally opposed from the start by its only competitor, Hawaiian Airlines. And at first, it had to buy all en route communications from HAL. But with the great increase in air travel popularity, Aloha was able steadily and rapidly to expand its operations. Its fleet grew from one to five DC-3s. And it succeeded in obtaining mail pay.

Tongg's prediction that TPA would earn $125,000 in 1952 suggests the airline is at last on its way to success.

OFF THE LINE

Sabena Belgian Airlines have installed all-weather flight instruments in two of its three Bell 47D-1 helicopters (the third 47D-1 went into service in July). Instruments include artificial horizon, gyro compass, rate of climb, and turn and bank indicator, mounted on the pedestal of the helicopters. Purpose is to extend the utility of the craft to fly in instrument weather along Sabena's 268-mi. airmail route. Carrier says that with these instruments, pilots can bring copters into GCA airports in almost any weather.

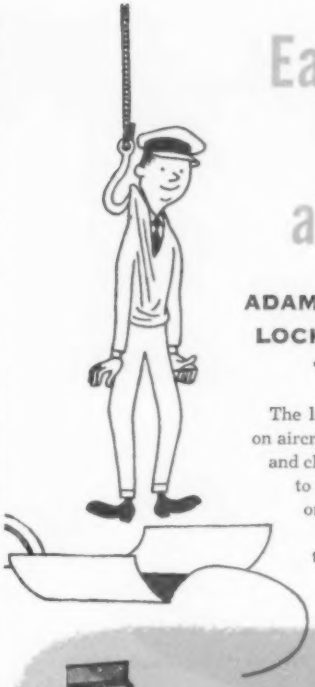
Esso Export Corp. has a contract, commencing July 1, 1952, to provide service and supply of aviation fuels and engine oils to U. S. government aircraft in 95 cities located in 42 countries in Europe, Africa and North and South America. Esso says that it is the most extensive contract of its kind ever entered into by the government. Grades of gasoline involved are 115/145, 100/130, 91, 98, 80, and jet fuels.

Eastern Air Lines' mammoth line maintenance building in Miami is progressing rapidly. Foundation and underground piping of the $5-million, 1,219-ft.-long building are approximately 95% complete. Grading for the 29 acres of

Easiest way to get into an airplane?

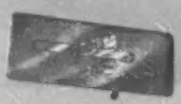
ADAMS-RITE SPECIALIZED LOCKS ARE DESIGNED TO DO THIS JOB BEST

The locks shown below for exterior doors on aircraft are among hundreds of locks, latches and closure devices developed by Adams-Rite to meet specific requirements. Perhaps one of these locks can be adapted for your use . . . or our engineers are available to design and produce any type of closure device to your exact need.



UD59 LOCK

Permits actuation of dogging bolts which positively lock door top and bottom only after door is closed and initially restrained by latch. May be locked and unlocked from outside. Inside handle always operable for emergency exit. Weight 2.5 pounds.



1421 PRESSURIZED LOCKING HANDLE

Flush design, pressurized. Locks and unlocks outboard by key and flush handle which is ejected by push button. Inboard handle always operable. Adaptable for driving bolting system. Weight 1.6 pounds.

AR67 PRESSURIZED LOCK

Locks and unlocks outboard by key and large exposed handle. Inboard handle always operable. Approved for use on exterior doors on pressurized aircraft. Weight 2.8 pounds.

1277 FLUSH LOCK

Flush design, pressurized handle with spring latch action. Locks and unlocks outboard by key and flush handle which is ejected by push button. Door secured by slamming against spring-loaded latch bolt. Inboard handle always operable. Weight 2.5 pounds.

Engineering Data Available

ADAMS-RITE MANUFACTURING CO.

540 WEST CHEVY CHASE DRIVE, GLENDALE 4, CALIFORNIA, U. S. A.

WICHITA-ST. LOUIS AREA —GEORGE E. HARRIS, MUNICIPAL AIRPORT, WICHITA, KANSAS

This new Bendix-Pacific development is an extremely compact and very lightweight S-band beacon. It is designed for use in aircraft and guided missiles, to increase the operating range of the tracking radar by reinforcing the normal echo with a retransmitted signal.

Despite its minimum size, the beacon has been fully engineered to withstand the shock, vibration, and temperature conditions encountered in missile installations.

SPECIFICATIONS:

Sensitivity:
—40 dbm signal for steady triggering

Output:
Power: 50 peak watts nominal
Frequency: 2700-2900 mc.

Pulse Width:
.6 microseconds to 3 db points

Repetition Rate of Interrogator: 200-2500 pps.

Power Requirements:
6.3 volts AC or DC ±10% at 4.0 amps.
300 volts DC nominal at approx. 120 ma.

Controls:
Accessible through end of case. Cavity frequency control. Sensitivity control.

Stability:
Frequency drift less than 3 mc.

Delay Time:
Delay between received and transmitted pulses approximately 1.5 microseconds.

Environmental Conditions:
Acceleration of 55 G's on longitudinal axis for 5 seconds.
Vibration of .06 in. total amplitude at 50 cps for 3 minutes.
Shock of 30 G's for 11 milliseconds in any plane.
Pressure sealed for high altitude operation.
Requires no forced air cooling for continuous operation between —55° C (—67° F) and 38° C (100° F).

Size:
3½ dia. x 12 in. long exclusive of connectors.

Weight: 5.5 lbs.

In addition to the S-band beacon Bendix-Pacific can supply similar equipment to cover the X-band, or to answer only a definite coded interrogation.

Complete engineering assistance is also available for other types of beacons to meet any specific requirement. Complete information will be sent to qualified companies.

Bendix
Pacific Division
Bendix Aviation Corporation
NORTH HOLLYWOOD, CALIF.

complete. Grading for the 29 acres of concrete apron that will surround the structure is finished and surfacing is underway. The maintenance building is similar to EAL's existing overhaul facility. It will be able to accommodate 16 Super Constellations simultaneously.

Specialties, Inc., needed a wind-tunnel to test its angle of attack system, but costs were prohibitive. So it made its own. The Syosset, L. I. firm's pocket-size tunnel has a 2-sq. in. working section, is powered by a 1-hp. electric vacuum cleaner blower which provides wind velocities up to 200 knots. Accuracy of measurements taken in the tunnel exceed 1/10 of 1 degree, according to Specialties.

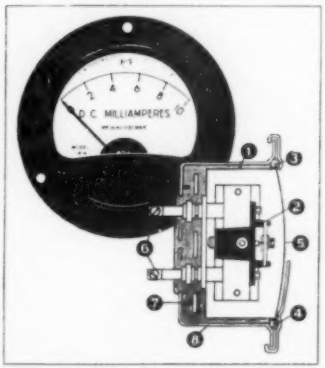
NEW AVIATION PRODUCTS

Larger Sel-Lok

Rising demand for Sel-Lok Spring Pins has caused the manufacturer to add larger diameter units to its production line, the company reports.

These pins are dowel-like fasteners consisting of a hollow pin split lengthwise so it can spread and lock in the hole. They are available in standard and light-duty wall thicknesses. In larger sizes now being introduced they are supplied in .312- .375- and .500-in. diameters.

Self Lock Fastener Corp., 259 Stephens St., Belleville 9, N. J.



Meters Resist Shock

Improved electrical measurement meters meeting Specification MIL-M-10304 and ruggedly built to withstand extreme conditions encountered by military aircraft are the latest in a line of precision products produced by Sun Electric Corp.

The meters are available as d.c. volt-

sps aircraft fasteners

UNBRAKO

STANDARD "SIX-DIGIT" ENGINE BOLTS

All listed diameters—hex and internal wrenching types. AN specifications.

NAS SHEAR BOLTS

Close tolerance, high strength, flush head type.

NAS INTERNAL WRENCHING LOCK NUTS

Superior safety nuts. Sizes from ¼" to 1½".

NAS INTERNAL WRENCHING AIRCRAFT BOLTS

Latest NAS specifications. Threads are fully formed by rolling after heat treatment.

INFORMATION UPON REQUEST. ADDRESS DEPARTMENT 678.

FLEXLOC

FLEXLOC SELF-LOCKING NUTS, REGULAR TYPE

Both stop and lock nuts. One piece construction, resilient segments lock positively with uniform torque. Aircraft approval, sizes #4 to 1¼" inclusive. Regular steel FLEXLOC approved for temperatures to 550°F.

FLEXLOC SELF-LOCKING NUTS, THIN TYPE

Less than regular height, yet conform to accepted standards. Every thread, including the locking threads, carries its share of load. Have all regular FLEXLOC features, but save weight and height. Aircraft approval, #6 to 1¼".

FLEXLOC EXTERNAL WRENCHING NUTS

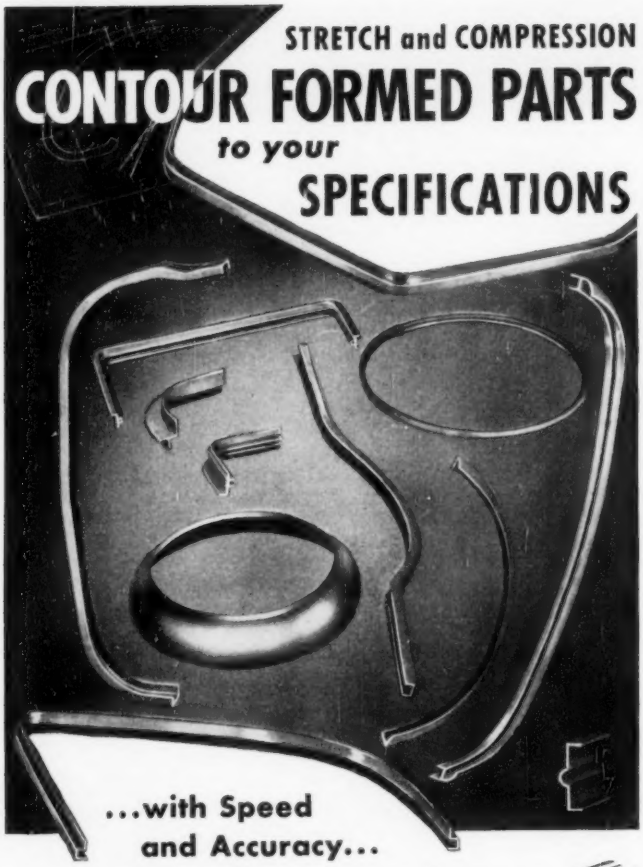
Incorporate famous FLEXLOC self-locking principle and one-piece, all-metal construction. Latest NAS specifications. Sizes from ¼" to 1½" NF Thread Series. Approved for temperatures to 550°F.

INFORMATION ABOUT FLEXLOC ON REQUEST. ADDRESS DEPARTMENT 51,

AIRCRAFT PRODUCTS DIVISION

STANDARD PRESSED STEEL CO., JENKINTOWN 3, PENNSYLVANIA

STRETCH and COMPRESSION
CONTOUR FORMED PARTS
to your
SPECIFICATIONS



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and Accuracy...
no buckling of horizontal flanges

Economy is one of the many advantages that make Contour Forming an important factor in the construction of aircraft, jet engines, guided missiles, railroad coaches, trucks, buses, etc. Single or compound curves, true, full circles or segments, shallow bends or short radius curves can be formed in most metals, including 95% titanium. Many manufacturers have profited by using our highly experienced Forming Division as an extension of their own production facilities. Send us a print and quantity requirements of some of your needed parts and we will quote on them.

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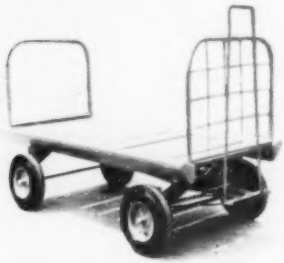
meters, ammeters, milliammeters and micro-ammeters and are precise enough for critical electrical functions involving control, direction, transmission and signaling, according to the firm.

Here is a point-by-point listing of improvements, as given by Sun:

- **Meter mount shock-mounted** and housed in rubber-lined case.
- **Meter movement supported** by die-cast frame for greater strength and accuracy.
- **Observation window ribber** grommeted and sealed to rubber lining providing hermetic seal of high dielectric strength.
- **Non-rigid mounting** of observation window increases resistance to shock.
- **Slight convexity of window** reduces chances of breakage.
- **Terminals side-tapped** and provided with tinned binding screws to facilitate wiring.
- **Breakage or damage** in wiring reduced through non-rigid mounting of terminals and use of flexible interior conductors.

Sun Electric Corp., 6323 Avondale Ave., Chicago 31, Ill.



Light Baggage Cart

New lightweight baggage cart designed for one-man use is capable of handling up to 1,200 lb. of luggage or other cargo. Built of an aluminum channel frame, oak flooring and steel bumpers, the cart is 76 in. long, 36 in. wide and its floor is 16 in. from the ground. Ten have been ordered by Pioneer Air Lines.

Texas Metal & Mfg. Co., 6114 Forest Park Road, Dallas, Tex.

Wide Angle Lens

A wide-angle lens for high-altitude photography, capable of covering fields of 90 deg. at openings up to f6.3 and with focal length of 5¼ in. is being used in the giant RB-36 reconnaissance bombers of the 5th Wing based at Travis AFB, Calif.

Named the Metrogon, the coated optic is reported to be virtually distortion-free.

Bausch & Lomb Optical Co., Rochester, N. Y.

Canadair JOINS Beech IN CHOOSING . . .

Canadian version of the T-36 twin-engine pilot trainer.

USAF T-36. An advanced twin-engine pilot trainer and military utility aircraft.

South Wind

CENTRAL STATION HEATING PACKAGE

Rates South Wind output highest *in so compact a unit!*

Now—from Canadair and Beech Aircraft Corporation—comes new proof, new acceptance of South Wind superiority in Central Aircraft Heating!

Compared with ordinary type heating systems, this new South Wind package provided Beech with a unit 25% to 50% *less* in weight. A unit 50% to 65% *less* in initial cost. A unit with up to 75% *less* service requirements, service costs and spare parts requirements.

Ideal for large cargo planes, large multi-engine transports and ground heating in support of these aircraft, this new South Wind Central Heating Package affords savings never possible before in aircraft heating. Why not find out *why* yourself? Check—right now—the performance advantages shown below. Write South Wind for complete details *today!*

Only South Wind combines all these advantages in Aircraft Central Heating

1. **Ability to produce regulated outputs between 350,000 and 600,000 BTU/hr. constant heat flow.**
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3. **Low pressure drop.**
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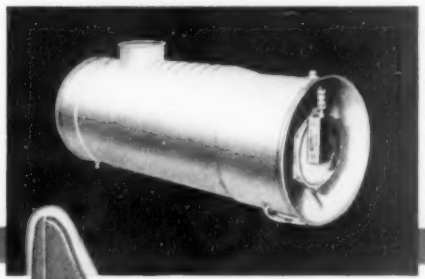
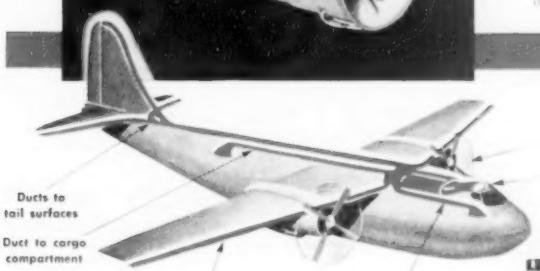
5. **Proved in field and production experience.**

To Solve Your Heating Problems write today for the experienced counsel of South Wind's trained field engineers in adapting this or any other model in the complete South Wind line of heaters for commercial, military or civilian aircraft. Model range in capacity from 20,000 to 700,000 BTU/hr. South Wind Division, Stewart-Warner Corporation, Indianapolis 7, Indiana. Stewart-Warner Corporation of Canada, Ltd., Belleville, Ontario.




Two 700,000 BTU/hr. packages side by side in top of ship.
Air scoop
Ducts to tail surfaces
Duct to cargo compartment
Duct to forward cabin
Duct to wings

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Scrap from shearing and blanking is remelted immediately at Reynolds plants without costly loss of time, segregation and storing, reshipment between cities, or diversion of valuable metal. You can use *all* of the aluminum you receive . . . without delay . . . without scrap loss. In addition, you realize important savings in handling, storage space, work space and manpower.

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For additional information, write for literature, or call the Reynolds office listed under "Aluminum" in your classified telephone directory. Reynolds Metals Company, Parts Division, 2059 South Ninth St., Louisville 1, Kentucky.

Reynolds Aluminum Fabricating Facilities

One of the country's most complete facilities for aluminum fabricating includes:

- **Over 100 mechanical presses ranging from 2 to 1700 tons.**
- **Hydraulic presses from 300 to 5000 tons.**
- **Equipment for shearing, blanking, forming, riveting and welding, roll forming, finishing and assembly.**

These facilities can assure a steady flow of blanks or fabricated parts to your specifications and production requirements.

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Three Airline Mexico Certificates Voided

- **President cites six years of failure in attempted negotiations as one of reasons for his action.**
- **Another: It gives U.S. agencies a fresh start and free hand in bargaining. Braniff, EAL, WAL hit.**

By F. Lee Moore

In an action unprecedented in U.S. civil aviation history, President Truman has canceled the Mexican certificates of Braniff, Eastern and Western airlines. The certificates were issued six years ago in the Latin America service case, but these three airlines never got Mexican permission to operate the route, although American Airlines and Pan American still operate the Mexican routes they gained previously.

The President withdrew the Braniff, Eastern and Western certificates without consulting State Department or the Civil Aeronautics Board. He has ordered State to hasten preparations for fresh negotiations to get a "fair and equitable bilateral air transportation agreement providing for a sound pattern of air transportation between the two countries."

▶ **Turnabout**—This is a new approach to foreign air negotiations. Generally, CAB assigns routes after lengthy procedural consideration, and then State, with Board participation, tries to get the needed landing rights.

In the Mexican situation, the President has turned that around: State and CAB may negotiate additional rights into Mexico. Then the Board would issue certificates in accordance with the pattern accepted by Mexico and the U.S., after the usual procedural hearings.

The cancellations brought immediate speculation among industry observers as to whether undue influence had been brought to bear on the President by one of the U.S. airlines now serving Mexico.

In his letter to CAB Chairman Donald Nyrop, the President cited three main reasons for his action:

• **Six years' failure** of negotiations under the previous state of affairs.

• **To smooth negotiations** by giving U.S. negotiators a free hand in bargaining, with a fresh start.

• **To stop airline interference** on an individual basis, confusing normal "government-to-government" bargaining procedures. For example, Eastern Air Lines recently made a deal with Mexico that would have allowed EAL to serve the coveted Mexico City route; but the EAL-Mexico deal also required that the U.S. government allow reciprocal rights to a Mexican line; and Eastern's rights were to be good only as long as the Mexican line made a profit on its U.S. operation.

This and other recent individual negotiations with Mexico had thrown U.S.-Mexican relations "into a turmoil recently," a U.S. government official told AVIATION WEEK.

The President's action stirred more discussion in civil international aviation circles than any Truman act since his overruling of CAB's denial of the Pan American Airways-American Overseas Airlines merger.

▶ **The Questions**—Hot questions discussed by international aviation officials of CAB, State and the airlines:

• **What airline will win?** American and PanAm already serve Mexico City; under the President's action, Braniff, Eastern and Western may no longer have any claim at all to be next. If any new airline gets Mexican rights after new negotiations, it could be Delta-C&S or National or some other line, as well as any of the three who lost their certificates, some observers have predicted.

• **Ousted airlines' claims?** One question is whether Braniff, Eastern and Western may claim prior, "grandfather" rights to any new future Mexico certificates that CAB may issue.

• **Precedent?** Might the President's unorthodox approach to bilateral air agreements be repeated in event of future thorny situations similar to this? Right now, whole certificates are not held up by inability to get foreign landing rights; some individual points—parts of certificates—are so held up, but a CAB official said he doubted the President could or would withdraw his signature from part of a certificate. Some individual points on U.S. airline certificates still held up by the foreign governments are Braniff to Bogota, C&S to Netherlands West Indies, PanAm to Paraguay and a string of Brazilian East Coast towns.

• **Why were CAB, State not told?** Some Washington observers wondered why the President acted without consulting State or the Board first. But a State Department official told AVIATION WEEK that the air controversy has long been a thorn in the side of general U.S.-Mexican economic relations; and the President has been close to these problems—hence probably felt no need for lengthy discussion.

▶ **Outlook**—Observers at State Department and CAB said the President's action may have cleared the air and given an opportunity for a successful bilateral air agreement. They pointed out that the situation could get no worse than it has been since 1946.

CONESTOGA TREKS WESTWARD

This World War II surplus Budd RB-1 Conestoga was recently picked up in Cuba by Trans-Air Hawaii Ltd., and flown to the Islands for freight operations. Stainless steel freighter is specially adaptable to the salty atmosphere and hauling of fish by air, which is commonplace in Hawaii. The Budd is said to have good short field characteristics and to be able to carry 11,000 lb. It is powered by R1830-92s.

Coach Convairs

- **Maker and CAB push new convertible version.**
- **A flexible arrangement could seat 30 to 56.**

Consolidated Vultee and Civil Aeronautics Board are both urging airlines to specify Convair's "convertible" passenger-seating arrangement in the 170 Convairs now on order. The convertibles allow an easy switch to seating densities from 30 to 56 passengers instead of the standard 44 seats now specified.

For $25,000 extra per new plane, the "convertible Convair" boasts a 27% bonus in revenue capacity, the manufacturer's brochure claims, plus ability to change seating arrangement temporarily and at will to meet varying demands of different routes, seasons, competitive fares and charters.

None of the U. S. lines has agreed to the change so far.

▶**Twin-Engine Wedge**—Convair is actively pushing convertible or coach versions because it believes these more economical planes may allow the twin-engine Convair to invade the long-range and high-density markets hitherto monopolized by the four-engine transports.

Convair maintains that the seating density on the convertible version is so easily changed that it is "adjustable to suit each day's route assignment of the airplane." Even the 56-seat arrangement is "luxury standard." Convair claims, since it allows 34-in. spacing and a lot more room underneath the seat ahead for a passenger's feet. And on a popular flight that is often sold out, an airline can add 12 more seats the morning of the flight and garner $300 or more extra revenue, Convair says.

Rather than change its assembly line, Convair has arranged for AiResearch Div. of Garrett Corp. to do the job after the planes come off the line. The flexible seat spacing is made possible by track mounting of the four rows of seats, with bolt holes one inch apart. The present "standard" CV-340 seats 44. For extremely long-range flights up to 2,000 mi., seating in the convertible can be reduced to only 30 passengers. For high-density seating there is room for 56 seats without moving a single bulkhead or facility.

Convair's brochure states, "Traffic trends and competitive situations may dictate that the 56 seats be used in low-fare service, in which event the 27% increase in seats (from 44 to 56) brings more potential gross revenue per flight than from 44-seat standard fares." For example, a 56-passenger plane at a 5-cent-a-mile fare has more revenue potential than a 44-passenger plane at 6 cents or more, and amortization of the $25,000 convertible installation is completely negligible in this consideration.

Says Convair: "Thus the convertible offers two important advantages in today's airline picture: It smothers rising operating costs with increased revenue potential; and further, it provides capacity for this money-making operation even at reduced fares."

▶**CAB Pushing Convertible**—Gordon Bain, director of CAB Bureau of Operations, along with most of CAB's economics staff, has been urging U. S. airlines to enter the aircoach market actively, either by buying the Convair convertible, buying new aircoach planes or converting planes. But out of the approximately 300 new transports on U. S. airline order, only Pan American's DC-6Bs are coaches, and no U. S. line has yet ordered the convertible Convair, according to latest reports.

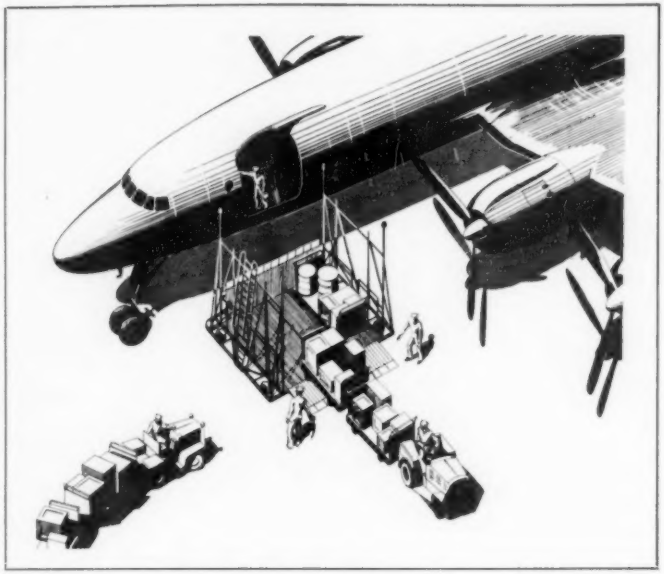
Only foreign airlines have ordered convertibles so far: KLM, Philippine, Avensa, Cruziero do Sul and Finnish.

▶**Convair Optimistic**—But Convair estimates that "of the more than 170 undelivered 340s now on order, a majority will wind up as convertibles."

Convair quotes a "prominent airline president" (possibly PanAm's Juan Trippe): "In the future all airplanes should certainly have this convertible feature. If we had had this possibility on our airplanes, it would have saved us as much as $200,000 on each plane through elimination of direct costs alone, without considering the revenue loss from the airplanes being out of service during modification."

PanAm is converting many of its four-engine planes to flexible seating, as well as ordering new coach DC-6Bs, according to CAB staffers.

Last spring, Convair was even talking of 70-passenger Convairs for short-range aircoach service (AVIATION WEEK Apr. 7, p. 67).



USAF, Navy Buy Big Loading Lift

A re-engineered, larger-capacity loading lift for servicing cargo planes is now in quantity production for the Air Force and the Navy. Known as the Aerolift, this hoister was originally described in conjunction with Lockheed Aircraft Corp.'s cargo studies (AVIATION WEEK Dec. 24, 1951, p. 20). The units are now being produced by Essick Mfg. Co., Los Angeles, with initial deliveries slated this month.

Aerolift will hoist a 13,000-lb. load 12 ft. in 1½ min. The unit can be assembled or dismantled in ¼ min. or less, and will stow for shipment in the belly of a Super Constellation, along with other cargo.

The lift, incorporating a 10x10-ft. platform, can be towed from plane to plane. In addition to its cargo job, it will be handy for handling litter patients for ambulance planes and can also double as a work platform for aircraft maintenance crews.

Tigers Win Navy Contract from Slick

The Flying Tiger Line, after a battle of low bids and Civil Aeronautics Administration proceedings, has captured Slick Airways' Navy supply transport contract. It currently is worth up to $300,000 gross revenue a month and may expand.

Tiger Line won on a low bid of 73.9 cents a C-46 plane mile. This was 3.1 cents, or 4%, under the existing CAB tariff of 77 cents—the rate that Slick bid for renewal of the contract.

Tiger Line says the contract will boost its annual airfreight revenues 60%. Slick claims the contract will operate at a loss or at least no profit, and may also break the charter rate structure of the airline industry if the Board cannot control it. Both the airfreight and combination carriers raised freight tariffs this spring because of rising costs.

▶ **Protests**—The contract requires a daily transcontinental roundtrip freight pickup service along Navy's main East and West Coast supply bases; it averages 2-3 million ton-miles a month. Details of its economics and operation first appeared in AVIATION WEEK (June 11, 1951, p. 12).

When Slick's contract came up for renewal in June, Tiger went below Slick's 77-cent rate with a 73.9-cent bid. Slick protested to Navy and the Board that this was beneath Tiger's cost and the CAB tariff on file for both airlines. But Tiger had filed its new rate proposal. So Slick made a new bid to Navy at the 83.9-cent rate and filed it with the Board, but protested both its own and Tiger's bids.

CAB suspended the low tariff pending investigation, then opened a proceeding and held a prehearing conference. Slick continued operating the contract into July and August, on an extension, pending decision. But Tiger held the tentative Navy award.

Then Navy Secretary Dan Kimball urged the Board to vacate its suspension of the lower rate on grounds the Navy would save from $8,000 to $16,000 a month. Tiger indicated at CAB examiner Bryan's prehearing conference that it would go ahead on the Navy contract. The airline argued that it was a contract, not common carriage, operation—hence not subject to CAB rate control.

▶ **Board Bows to Navy**—The Board maintains that the contract is common carriage, since Slick and Tiger offer this type service to the general public for any company or agent to accept.

But CAB acquiesced, temporarily, vacated the suspension of the 73.9-cent tariff. Navy handed the contract to Tiger.

The Board is continuing investigation of the tariff's economic justification to find if the new rate is uneconomic, as Slick charges. If it decides the rate is too low, CAB may order the Flying Tiger Line to charge Navy a higher rate.

Should that happen, Tiger will have two main options: contest CAB jurisdiction in the courts or attempt to renegotiate the rate with Navy. There is a question of whether that might reopen the contract and give Slick a new chance.

PAA and Guatemala Reach Agreement

(*McGraw-Hill World News*)

Guatemala City—The government and Pan American-World Airways have agreed on details of a five-year operating contract, according to joint announcement by Communications Minister Carlos Aldana Sandoval and J. H. Wilson, PAA Guatemalan manager.

Signature was expected momentarily, with the required approval by Guatemala's Congress to follow promptly.

The agreement ended an 11-month period during which PAA had been on a day-to-day operating basis in Guatemala.

Wilson and Frank Powers, PAA Latin American special representative, said settlement of operating rights paves the way for settlement of labor troubles that caused PAA to halt its Guatemalan operations July 21. Wilson said a labor settlement would permit early resumption of operations.

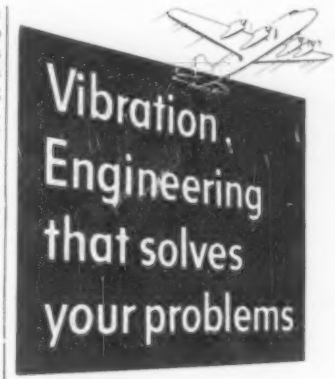
CAA Relaxes Its Ruling on Spoilers

Civil Aeronautics Administration will now permit manufacturers and airlines to remove the "spoilers" from the wings of the Boeing Stratocruiser and Douglas DC-6B. It is the same device CAA demanded on those planes for type certification.

The spoiler is a strip or moulding at the wing's leading edge to make it stall evenly; its disadvantage is that it results in slightly higher landing approach speed and lower maximum angle of attack, thereby reducing landing performance.

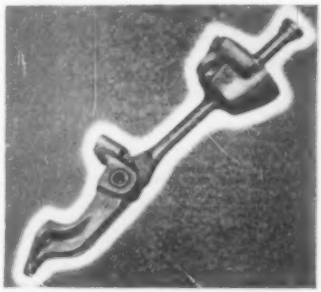
The CAA about-face follows revision of a Civil Air Regulation. The manufacturers were forced to put on the spoilers by a strict interpretation of Civil Aeronautics Board's stall characteristics requirement. CAA said the old rule required that a plane be flown into a deep, power-on or secondary stall condition without rolling before the nose dropped through from lack of lift.

▶ **No New Tests**—Manufacturers and airlines said this was an unrealistic re-



PROBLEM: To achieve a high degree of vibration isolation in high powered engines.

SOLUTION: MB Pedestal Aircraft Mounts.



It's the flexible mountings -- the only structural connection between engine and airframe – that absorb engine and propeller vibrations. Properly designed, they eliminate a great source of discomfort and protect the aircraft structure, accessories and instruments.

The MB Type 2770 Mount illustrated is an outstanding example of a properly designed mount. Service records confirm both its performance and durability. An *aluminum* unit, it also saves about 60 pounds per engine. These mounts are used for original and replacement installations on Pratt and Whitney engines.

Remember – MB products are available to help you on all phases of vibration problems . . . including shake testing, detection, measurement and control. That's why so many companies make MB their *headquarters* for vibration engineering.

*Reg. U.S. Pat. Off.

Pedestal MB Mounts are widely used both as original equipment and as replacement.

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quirement. When the federal agency stuck to its strict interpretation of the rule, however, the Aircraft Industries Assn. finally persuaded CAB to change the regulation.

But that was too late to save Douglas from several months' delay in certification of the new DC-6B model. Douglas ended up reluctantly installing the spoilers. Now they can be removed. New flight tests to prove the DC-6B meets the revised Board stall rules will not be required because the exhaustive flight tests during the 1951 CAA-Douglas spoiler controversy produced all the data needed.

Meanwhile, Boeing Airplane Co. and Pan American's Pacific division have completed flight tests qualifying the B-377 for spoiler removal under the amended regulation. United Air Lines has started removing the spoilers from both its DC-6Bs and Stratocruisers, and PanAm is doing the same with its Stratocruisers.

Copter Carrier Begins Fourth Year

Late last month Helicopter Air Service, Inc., started its fourth year of successful airmail service in the metropolitan Chicago area. In that time the carrier has compiled an impressive record, not the least of which includes making 160,000 takeoffs and landings—40,000 being from the post office heliport—without an accident.

Altogether the six little orange-painted Bell 47 copters have flown approximately 1 million miles and carried some 360 million pieces of mail along three circular routes, 90-106 mi. long, serving 55 communities around Chicago three times daily.

It is estimated that the carrier helped double the use of airmail in that area and increased its use by 300% in some sectors.

Snags in Merger Of Pacific Airlines

(*McGraw-Hill World News*)

Melbourne—Plans to merge three large Pacific Commonwealth airlines to present a solid front to Pan American World Airways' competition are reliably reported to have run into difficulties.

The carriers involved are British Commonwealth Pacific Airways, Qantas Empire Airways and Tasman Empire Airlines. The British, Australian and New Zealand governments are behind the merger, but technical advisors are slowing action by their divergent views. Strong British interest is due to hopes that if the merger goes through it will become an exclusive British market.

Airlines to Continue Roundtrip Discount

Because of improved revenues and earnings, the scheduled passenger airlines are abandoning their plea to Civil Aeronautics Board for higher fares. They had previously asked CAB permission to end their traditional 5% roundtrip discount.

They have given that up now, because higher business volume is tending to offset expense increases by reducing unit costs. And they know the improved earnings outlook is making the Board more reluctant than ever to permit the requested fare raise. They have an eye on the CAB investigation of economics of nonsked airlines, whose major contention is that the certificated airlines' monopoly position makes their fares more cost-plus than creative.

American Airlines, which led the fight last winter for a rate increase, has withdrawn from the Board proceeding it started. And United, TWA and Chicago & Southern also withdrew before or at the same time as American.

Eastern, Capital, Delta and others may be forced to withdraw, too, for competitive reasons. National Airlines, however, did not ask a fare raise.

Last winter, American submitted forecasts to CAB showing that rising costs would force higher rates this year, if earnings were to be preserved. Expenses have risen, but American's volume is up about 20%, an official says, so earnings are running close to last year.

New South Pacific Services Pushed

There is a minor boom on in the South Pacific to establish a new group of airline services to connect the numerous small, but attractive, tourist spots in the area.

Here are the recent moves portending establishment of the new carriers:

• Civil Aeronautics Board reversed itself recently and granted a certificate to Samoan Airlines Ltd., headed by Lawrence M. Coleman of Honolulu, which will initiate air service to American Samoa, now reached only by boat.

• Capt. Bryan Monkton, an Australian pilot, and Frederick Barnes, Sydney businessman, held discussions with Honolulu businessmen to get backing for a proposed Hawaii-Tahiti service via Christmas Island. The carrier, to be called South Pacific Air Lines, would operate a Short Solent flying boat. French governor of Tahiti flew to Honolulu, then to Washington and Paris urging encouragement of tourist travel to his island.

• Pan American World Airways has announced an agreement with Trans-Empire Air Lines, whereby TEAL will service Fiji and Samoa from Australia beginning Oct. 14, thus giving PAA its first direct connection to the Samoan area.

• Harold Gatty, Wiley Post's navigator on his 1931 'round-the-world flight, has announced that he has ordered a third DH Dove transport for his Fiji Airways.

Samoan Airlines plans daily service connecting British and American Samoa, and once-weekly service from American Samoa to Canton. It also plans flights to Tahiti, Fiji and Tonga. The carrier will use 20-24 passenger PBY-5A amphibians.

SHORTLINES

▶ **Air Transport Assn.** has dropped plans for airline pooling of slow-moving, heavy-investment parts inventory (AVIATION WEEK Aug. 27, 1951, p. 66)—found the problem usually the result of purchasing errors; also, airlines' many custom-built or modified items defied pooling.

▶ **American Airlines** set an all-time industry record of 275,666,000 revenue passenger miles in August, topping the previous record—set by AAL this June.

▶ **American Air Transport and Flight School,** Miami nonsked, has had its letter of registration revoked by CAB for flying too often, defying a Board cease-and-desist order.

▶ **Braniff Airways** motion that CAB dismiss from its mail rate proceeding the Post Office recommendation that Braniff be required to set up a profits equalization reserve has been denied by the Board.

▶ **British European Airways** claims a profit of $302,000 for July, up 114% from a year ago.

▶ **British Overseas Airways** hauled 13,064 revenue trans-Atlantic aircoach passengers the first four months of service.

▶ **California Central Airlines** hauled 189,765 passengers on its Martin 2-0-2s in the 11 months to this Sept. 1. . . . Company says the Martins boosted daily schedules 66% and enabled CCA to advertise the fastest flight time on the West Coast. . . . Company now has CAA approval for 1,200 hr. between engine overhauls.

▶ **Civil Aeronautics Administration** has set special exams for glider and copter

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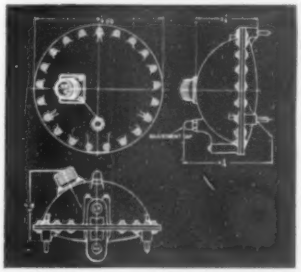

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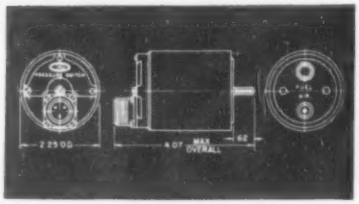

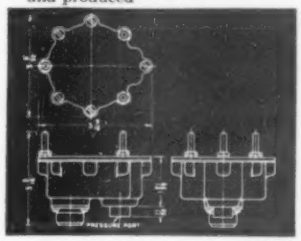

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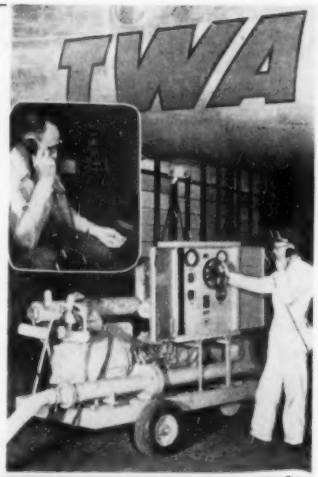

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pilot ratings . . . CAA has sent four airways specialists to aid Turkey in its airways installations.

▶ **Hawaiian Airlines** August traffic was up 23% from a year ago to 48,689.

▶ **Jugoslovenski Aerotransport,** Jugoslavia, has ordered three Convair-Liner 340s, raising commercial sales of that model over the $100-million mark—175 planes ordered by 30 parties. (USAF-bought military versions include the T-29 trainer and C-131A air-evac transport.)

▶ **National Airlines** annual report indicates that President G. T. Baker is discussing merger with Delta, Capital and other complementary route systems. . . . Company also is negotiating bank loans to pay for ordered equipment and will start nonstop New York-Havana service soon, the report reveals.

▶ **Northwest Airlines** load factor in August was 70%, compared with 69% in July and 77% a year ago.

▶ **Senate Small Business Committee** staff report applauds CAB certification of independent airfreight lines' Latin American routes as a precedent for the reopened trans-Atlantic airfreight case. . . . Also says the current CAB nonsked investigation results from the committee's June, 1951, report urging a plan to enable nonskeds "to operate in a way that will keep them a vital, going concern without in any way crippling or hurting the regularly scheduled carriers."

▶ **Silver City Airways** says its new winter auto ferry rates across the English channel are "reduced virtually to a boat level."

▶ **Southwest Airways** has been talking merger possibilities with Bonanza Air Lines.

▶ **Teterboro Airport** indirectly was cause of families keeping 80 children from returning to school near one of field's runways this month on grounds that the school location was "hazardous."

▶ **Trans-Canada Air Lines** may order more planes this year, for delivery in 1954. The airline reports Canada's traffic growth makes this necessary.

▶ **Trans-Pacific Airlines** August traffic of 24,809 passengers was up 38% from a year ago to an all-time high.

▶ **Trans World Airlines** retired almost all its DC-3 fleet this month, after starting Martin 4-0-4 service on medium-haul routes. Most of the 43 DC-3s remaining will be sold.

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SANTA CLAUS

Could Die of Old Age

No one shoots Santa Claus. This remark about a government which spends and spends and spends may well be true. But it is also true that Santa Claus is an old man. At his age overwork might well kill him.

It is with the possibility of working Santa Claus to death that this editorial is concerned. No position is taken as between the contending political parties in the present campaign. Our concern is with the problem of protecting Santa Claus.

It is true that as a nation we now enjoy great prosperity. The prosperity is not nearly so general as the political advertisements of it would suggest. Millions of individuals, notably those living on pensions, annuities and other fixed incomes, have been robbed of half their purchasing power by inflation during recent years, and whole industries know little or nothing of boom times.

However, measured by so basic a gauge as unemployment, we do have great prosperity. Less than two million of our total working force of over 64 million are unemployed, and many of them are unemployed only while moving from one job to another. The real income, i.e., what their dollars will buy, of those with jobs is somewhere near its all-time peak.

Our Prosperity is Precarious

The prosperity we enjoy, however, is precarious. This is primarily because it is dependent upon a rising volume of expenditures by the federal government. At present almost a quarter of our entire national income is ladled out through Washington, and in an ever increasing amount.

If, as matters now stand, federal expenditures were to be suddenly and sharply cut, our government-financed prosperity would be severely upset. But if the federal government were to try to keep right on providing prosperity by steadily increasing its expenditures, the end result would be more certainly disastrous. It would be a crash caused primarily by having continuing inflation of prices destroy the value of the dollar.

Higher government expenditures of worthless dollars then could accomplish nothing. Santa Claus would be dead from overwork

To Provide Firm Foundations

The general route to be followed in putting firm foundations under our prosperity is quite clear. It involves two steps which must be taken closely together. The first is to stop the continuous increase in federal expenditures. The second step is to substitute expanding private business for government-financed business as the principal foundation of expanding prosperity.

The increase in federal expenditures can be stopped without sacrificing any effective measures now directed toward meeting our top priority requirement – protection from armed Communist aggression. The most competent authorities of both major parties agree it can be done by (1) better planning of and the elimination of outright waste in defense arrangements, and (2) cutting those civilian expenditures which cannot be justified at the same time we are undertaking a great new load of defense expenditure.

It is also possible to substitute expanding private business for government-financed business. The problem is primarily that of relieving private business of the staggering load of federal taxation it now is carrying. Federal taxation now takes 52 per cent of all corporate profits and 82 per cent of all so-called excess profits. If it were not for the forced draft placed under our economy by rapidly mounting defense expenditures, this burden would surely lay a disastrous blight on private business expansion. If expanding private business is to have a chance to play its critical role as a substitute for government-financed business, its taxes must be cut, and soon.

It Won't be Easy

It would be naive to contend that it will be easy to check the expansion of federal expenditures. They have been running wild too long, and in the process contributing to a feverish, inflationary prosperity. Likewise, there is no reason to believe that the easing of the load of business taxes is going to be easy. The basic blight it puts on business expansion has been too long obscured by having our economy dosed with artificial stimulants, most notably enormous injections of federal expenditures.

The Key Question — How Long?

It is obvious that prosperity is going to be a major topic of discussion in the present political campaign. There is nothing the matter with that. Prosperity is a key concern of the voters in choosing a national administration.

To make the discussion of prosperity really useful, however, it is important to ask and get answers to the right questions about it. The key question is not whether or not we have prosperity. That we have it in large measure is generally conceded.

The key question is, "How long can we continue to have prosperity?" The answer — not very long if we continue to rely primarily on new injections of inflationary federal expenditures. Santa Claus, be it remembered, is no youngster. If we continue our present improvident course, he will be worked to death. Those politicians, regardless of party, who see this clear danger and who have plans to escape it are facing up to the crucial question about our prosperity.

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SW-5384, Aviation Week
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724	¾"x.049	4130
7465	1-⅛"x.065	4130
554	1-5/16"x.156	4130
4800	1-½"x.049	4130 & 8630
236	2"x.058	4130 & 8630
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Quantity	Part No.	Mfg.	Description
20	36001-0	Eclipse	Compass
11	14601-1F-B1	Eclipse	Gyro Indicator
71	828TY13Z2	Weston	Oil Temp Indicator
26	827TY14Z2	Weston	Cyl Head Temp Indicator
40	119862	Weston	Carb. Air Temp Indicator
10	15401-1	Eclipse	Amplifier (PB10)w/ED3 MOUNT
66	10078-1AG	Eclipse	Gyro Indicator
69	CQ-9	Eclipse	Clutch Switch (PB10)
20	12078-1	Eclipse	Amplifier (PB10)
57	MF45-3911-20Z	Vickers	Hydraulic Pump (3000PSI)
327	PF4-713-20BCE	Vickers	Hydraulic Pump
75	1416-12C	Eclipse	Starter
142	28008	Airesearch	Jack (Cowl FLAP)
6	12011-1	Eclipse	Transmitter
85	3123-3A	Eclipse	Warning Unit
45	AN4103-2	Clifford	Brass (Valve #U4785) Oil Cooler
120	MF9-713-15A	Vickers	Hydraulic Pump
550	TFD 8600	Thompson	Fuel Booster Pump
125	D7818	Adel	Anti-icer Pump
250	AN4014	Erie Meter	Wobble (D-3) Pump
1000	AN5780-2	G.E.	Wheel & Flap Position Indicator
400	AN5780-2	Weston	Wheel & Flap Position Indicator
115	P4CA2A	Parker	Primer
70	AN3213-1	Scintilla	Ignition Switch
450	A-9 (94-32226)	Nesco	Ignition Switch
90	H-950-R	Jack & Heinz	Starter Motor
53	AN6203-3	Bendix	Accumulator 10"-1500 P.S.I.
140	K14949E	Marquette	Windshield Wiper Kit
188	EYLC-2334	Barber-Colman	Control
11	12086-1C	Eclipse	Amplifier
250	558-1A	Eclipse	Oil Seperator
100	716-3A	Eclipse	Generator (NEA-3A)
89	318	Edwards	Horn
230	921-B	Stewart-Warner	Heater (200000 BTU)
97	6041H-146A	Cutler Hammer	Relay (B-12)
22	0655-D	Aro	Oxygen Resulator
65	ASDC2	CO_2 Mfg. Co.	Fire Detector
384	564-2A	Eclipse	Oil Seperator

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166	1045A	Bearing
500	3506	Flange
130	8288	Follower Ass'y
814	35814	Blower Ass'y
53	48362	Shaft
75	48363	Shaft
56	48392	Sump
390	48461	Gear
78	76236	Gear
1178	84289	Bearing
113	84487	Housing
77	84591C	Nose Housing
200	48150-D	Crankcase Ass'y
200	84083	Cylinder
100	84084	Cylinder
200	84085	Cylinder

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Quantity	Part No.	Description
247	PD12K10	Stromberg injection Carburetor
19	1375F	Holley carburetor
407	SF9LN-2 (manufacturer's part No. 10-12453-6 Spec. AN9511)	Bendix Scintilla Magneto
42	SF5RN-12 (manufacturer's part No. 10-26170-1)	Bendix Scintilla Magneto
185,000	LS4AD1	Spark Plug (Aero)

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SO THEY TELL US

Britain

A British movie now running in London flatly says England was the first to crack the sonic barrier, with no credit to Americans or the X-1. Ironically, John Derry, killed at Farnborough in a supersonic dive, was a technical adviser for the picture, titled "The Sound Barrier."

USAF recognition literature lacks data on a new Russian high-wing jet fighter already reported in MiG Alley—the LA-17—but you can buy a scale model kit of it in Hamley's toy shop in London's Regent St.

British sources say the U.S. job offer made a few months ago to Whittle came from Cornell Aeronautical Lab. He turned it down. Whittle is still enthusiastic about the future of centrifugal-flow jets, despite opinion to the contrary in both Britain and the U.S.

Since the RAF switched from fore & aft service caps to blue berets, it looks more like a French air force, AVIATION WEEK's Bob Hotz reports.

Military Services

Navy is keeping a tight security lid on West Coast operations of its P2V Neptunes in anti-submarine work.

Navy has ordered two turboprop Super Connies. Meanwhile, a Lockheed spokes-man says its L-206 turboprop medium cargo plane, being built for the Air Force, will fly early next year.

Some pilots, just back from Korea, say they still prefer bombs and machine guns to rockets, which they claim are unreliable and frequently stray.

Helicopters played a major role in rugged, week-long Marine maneuvers at Fallan, Nev., observers say. Praise for copter performance was high, although one of the 20 craft being used crashed.

Safety

When the exhaust valve pushrod snapped during an evening flight of a Los Angeles Airways S-55 helicopter, the pilot cut the power and landed on auto-rotation. Only damage came from two small boys who tried to climb into the ship while it was unguarded in a field.

A ruptured diaphragm in the control boost system is blamed for a recent Navy Banshee crash near Los Angeles. The ship went into a series of erratic rolls and crashed. An investigator says the pilot could have averted disaster by turning off the boost system, but it was only his second checkout flight in a Banshee and he was unfamiliar with the procedure. Some Banshees were grounded for a time.

Backward-facing seats in airliners continue to be a lively topic, but safety experts are not agreed on the subject. Ditching last month of a British Hermes—with backward seats—with 50 of the 57 occupants surviving, aroused interest. But those who are still studying the subject point out that there have been many instances of ditching aircraft, with forward-facing seats, in which all passengers have survived.

Transport

Atom-powered planes will be widely used by airlines in 1975, Dr. Albert Plesman, KLM's president, said in a speech. AVIATION WEEK's Amsterdam correspondent writes that the speaker forecast that unlimited radius, speeds of 900 mph., and altitudes of 11 mi. would be attained. Such planes would fly 5,000 hours a year and would cost $13 million each.

CAB is said to be under increasing pressure from the military to certificate new commercial cargo carriers and build up the nation's airfreighter fleet which could be readily convertible to military cargo in an emergency.

Industry

A West Coast manufacturer says its missile program is being retarded by constant Air Force changes in specifications. "Leave us alone a while so we can get into production" is a prayer AVIATION WEEK hears from missile firms everywhere.

The same engine shortage that plagues most plane makers may set back first de-liveries of production models of Douglas' RB-66 at Long Beach.

Press

No decision on naming a publisher of Skyways magazine is expected for "a few months," according to a spokesman.

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Only TAC has perfected and produced the open-end ratchet wrench!

Four series of sockets cover 64 sizes from ¼" to 4". Crowfoot (fixed type) wrenches are also produced. *All Details of our tools are protected by Patent numbers 2578686 and 2578687. Other Patents pending.*

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Los Angeles, California

For information about TAC Wrenches see your Industrial Supply Distributor

LETTERS

Boeing Stock

In AVIATION WEEK Aug. 11, in an article entitled "Boeing Awards Stock to Allen," the following statement is made:

"Award of 1,198 common shares of Boeing Airplane Co. stock to William M. Allen, President, making a total holding of 3,302 shares, is reported in the latest Securities & Exchange Commission report."

An examination of the report which I filed with the Securities & Exchange Commission will reveal that of the 1,198 shares referred to, 1,052 were acquired by reason of the 50% stock dividend declared last May on all outstanding stock of the company. The remaining 146 shares I received as an award under the Incentive Compensation Plan of the Company, which is participated in by all supervisors of the Boeing Airplane Company.

WILLIAM M. ALLEN, President
Boeing Airplane Company
Seattle 14, Washington

(Boeing also has informed AVIATION WEEK that the 144 shares to J. O. Yeasting, mentioned in the same story, were received as a stock dividend, not as an award.—ED.)

'Grasp of a Problem'

On page 39 of your June 30 issue, you published an excellent article on unitized avionic assemblies titled "The Hurdles of Avionic Complexity," by Philip Klass. Mr. Klass is to be congratulated on his quite evident grasp of a complex problem.

We would appreciate it very much if you could furnish us with ten or 12 reprints of this article for circulation within our Electronics and Missile Section.

A. H. DRAYNER,
Senior Electronic Engineer
Consolidated Vultee Aircraft Corp.
San Diego 12, Calif.

From Protection, Inc.

On June 2 you carried a picture with caption on page 16 dealing with the new Lockheed visor. In the abbreviated style of the caption, John R. Margwarth is given credit for designing the visor and the helmet. Actually Mr. Margwarth did design the visor which is now being used on our Toptex helmet, but I am sure he would be the first to deny any credit for the helmet.

The Toptex helmet was designed at the University of Southern California by Dr. Charles F. Lombard and Mr. Herman P. Roth more than three years ago and has come to be the accepted helmet for test pilots across this nation and is being seriously considered as the standard for military pilots.

Your magazine and several others have published scientific writeups (New Helmet Protection Theory Advanced, 1-24-49), but otherwise our headgear has been the unknown helmet in more news releases than any other item in the history of aviation. It has been the cover on several magazines, has figured in new stories dealing with practically every jet plane that has flown and has been shown on the heads of some of our aces in Korea, but always the story is about the man or the ship, and the helmet has never yet been named in a magazine or newspaper illustration.

One reason, of course, is that we have continued during the past three years as a laboratory operation and have not started our advertising campaign and have not sought public recognition for our product.

L. P. CORBETT
Protection, Inc.
6521 West Blvd.
Inglewood 3, Calif.

France's Position

For once, AVIATION WEEK has been misinformed. I refer to your July 21 issue and the article headed "U. S. Funds Will Aid Europe's Air Industry." I refer more particularly to the paragraph, page 13, starting with "The French are not likely, etc."

The fact is that, of all claimants for offshore procurement contracts, the French are those who require the least amount of assistance in the form of machine tools (if at all—over and above what was previously agreed—which in turn was very small as compared to other European countries such as the U.K.).

The French are interested in offshore procurement contracts because the taxpayer's money goes in first priority to Indo China and to maintaining and building up NATO forces, so that little is left for procurement of aircraft. They require financial assistance, not machine tools. Therefore, if the French were to be left out of the OSP, reasons other than those stated in the July 21 issue of AVIATION WEEK would have to be produced.

I am writing as a faithful AVIATION WEEK reader and subscriber, not in any official capacity. I hope, however, that this letter will prompt you to seek further information from reliable sources.

A. ESPERET
Colonel, French Air Force
5171 Manning Pl., NW.
Washington, D. C.

Fashion Frocks & GIs

In your issue of July 21 appeared the following item:

"The feminine touch has crept into Korean frontline air bases. GIs in the parachute department noticed with a chuckle that the chutes' packs display neat little labels reading 'Manufactured by Fashion Frocks.'"

The purpose of this letter is to ask your permission to reprint that item in our employe publication . . . with proper credit to AVIATION WEEK, of course.

We have about 1,600 women in our employ, and they get a big kick out of anything that calls to mind that they are helping to produce a very vital defense item.

It was gratifying to all of us here to learn that our chutes are getting through to the front lines.

JOHN J. ROBINSON
Director of Public Relations
Fashion Frocks, Inc.
Cincinnati 25, Ohio

Korea's Different

Since leaving home—Central Islip, L. I.—two months ago, I've been lost without my weekly orientation with the rest of the aviation world—and would appreciate your forwarding my copies to the address below.

I guess some of our present maintenance practices here in Korea would astound a lot of the boys back at Lockheed Aircraft Service at Idlewild. Believe me—they sure are astounding me. All I can say is that being Supervisor of Maintenance on B-26s here sure is different from being Purchasing Supervisor at Lockheed. . . .

Please keep your excellent magazine coming, and send me the bill to cover the next three years.

MAJOR R. A. PISANI, AO319672
3rd Maintenance Sqdn.
A.P.O. 970 c/o Postmaster
San Francisco, Calif.

From Piasecki

Your article on our H-21 Work Horse helicopter in the July 21 AVIATION WEEK has won nothing but praise from our engineers, service and sales personnel in the past week.

We all feel that Dave Anderton did a fine job. The quality of his reporting must be one of the reasons why your magazine is read by everyone I know in the aircraft industry.

CLAUDE O. WITZE,
Director of Public Relations
Piasecki Helicopter Corp.
Morton, Pa.

Doman's 'V' Loan

We of Doman read with interest the July 14 AVIATION WEEK in appreciation of the article mentioning our progress by Selig Altschul, and the financial report. Considering the importance your publication is to the aviation industry we wish to bring to your attention an error in the latter. The "V" loan of $15,000 should have read $150,000.

CLAUDE D. ADAMS,
Dir. of Public Relations & Advertising
Doman Helicopters, Inc.
Municipal Airport
P. O. Box 603
Danbury, Conn.

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